2045

DRINKING WATER SURVEILLANCE PROGRAM

GUELPH
WELL SUPPLY

ANNUAL REPORT 1990

Ontario
Environment
Environnement

92/12/12

ISSN 1192-120X

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AUGUST 1992

Cette publication technique
n'est disponible qu'en anglais.

PIBS 2045
Log 92-2302-260

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

GUELPH WELL SUPPLY
1990 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

The Guelph Well Supply consists of a number of groundwater sources. Raw water is disinfected before distribution. When required, iron removal is practiced at some wells. The system has a design capacity of 90.46 x 1000 m^3/day. The Guelph Well Supply serves a population of approximately 76,600.

Raw water from three separate wells and treated water from three reservoirs along with two locations in the distribution system were sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols in the fall.

Table A is a summary of all results by group (there are separate tables for each raw water source).

No known health related guidelines were exceeded.

The Guelph Well Supply, as sampled by DWSP, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM - GUELPH - F.M. WOODS PUMPING STETION

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW TESTS	POSITIVE	%POSITIVE	TREATED TESTS	POSITIVE	%POSITIVE	SITE 1 TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	15	9	60	5	0	0	5	0	0
CHEMISTRY (FLD)	10	10	100	22	21	95	44	35	79
CHEMISTRY (LAB)	110	82	74	110	80	72	171	148	86
METALS	120	42	35	120	44	36	207	104	50
CHLOROAROMATICS	70	0	0	70	0	0	56	0	0
CHLOROPHENOLS	12	0	0	12	0	0	.	.	.
PAH	83	0	0	83	0	0	.	.	.
PESTICIDES & PCB	172	0	0	172	0	0	85	0	0
PHENOLICS	5	0	0	5	0	0	.	.	.
SPECIFIC PESTICIDES	57	0	0	57	0	0	4	0	0
VOLATILES	145	0	0	145	13	8	145	12	8
TOTAL	799	143		801	158		717	299	

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM - GUELPH - UNIV. OF GUELPH PUMPING STATION

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	SITE RAW TESTS	POSITIVE	%POSITIVE	TREATED TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	12	2	16	5	1	20
CHEMISTRY (FLD)	10	10	100	23	22	95
CHEMISTRY (LAB)	110	82	74	110	78	70
METALS	120	56	46	119	57	47
CHLOROAROMATICS	70	0	0	70	0	0
CHLOROPHENOLS	12	0	0	12	0	0
PAH	68	0	0	83	0	0
PESTICIDES & PCB	172	0	0	172	0	0
PHENOLICS	5	0	0	5	0	0
SPECIFIC PESTICIDES	57	0	0	57	0	0
VOLATILES	116	0	0	87	9	10
TOTAL	752	150		743	167	

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM - GUELPH - PAISLEY ROAD WELL

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

	SCAN	SITE RAW TESTS	POSITIVE	%POSITIVE	TREATED TESTS	POSITIVE	%POSITIVE	SITE 1 TESTS	POSITIVE	%POSITIVE
	BACTERIOLOGICAL	9	3	33	5	0	0	4	0	0
	CHEMISTRY (FLD)	6	6	100	18	17	94	50	34	68
	CHEMISTRY (LAB)	66	53	80	110	79	71	190	162	85
	METALS	72	35	48	120	51	42	230	126	54
	CHLOROAROMATICS	42	0	0	70	0	0	70	0	0
	CHLOROPHENOLS	6	0	0	12	0	0	.	.	.
	PAH	49	0	0	83	0	0	.	.	.
	PESTICIDES & PCB	104	0	0	172	0	0	107	0	0
	PHENOLICS	3	1	33	5	0	0	.	.	.
	SPECIFIC PESTICIDES	29	0	0	57	0	0	5	0	0
	VOLATILES	87	0	0	145	19	13	145	19	13
TOTAL		473	98		797	166		801	341	

DRINKING WATER SURVEILLANCE PROGRAM

GUELPH WELL SUPPLY
1990 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. In 1990, 76 systems were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Guelph Well System in the summer of 1990. This is the first DWSP annual report.

PLANT DESCRIPTION

The Guelph Well Supply consists of a number of groundwater sources. Raw water is disinfected before distribution. When required, iron removal is practiced at some wells. The system has a design capacity of 90.46 x 1000 m^3/day. The Guelph Well Supply serves a population of approximately 76,600.

The sample day flows for the F.M. Woods pumping station ranged from 26.7 x 1000 m^3/day to 37.0 x 1000 m^3/day.

The sample day flows for the Paisley Road well ranged from 0.7 x 1000 m^3/day to 4.5 x 1000 m^3/day.

The sample day flows for the University of Guelph pumping station ranged from 0.500 x 1000 m^3/day to 2.273 x 1000 m^3/day.

General information on the well supply is presented in Table 1. There is no schematic of plant processes, chemical addition points and sampling locations as found in most DWSP reports.

SAMPLING AND ANALYSES

Sample lines at the well head and reservoirs were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

At all distribution system locations two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service

connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals, due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples therefore, were General Chemistry and Metals. The free flow sample represented fresh water from the distribution main, since the sample tap was flushed for five minutes prior to sampling.

Attempts were made to capture the same block of water at each sampling point by taking the retention time into consideration. Retention time was calculated by dividing the volume of water between two sampling points by sample day flow. For example, if it was determined that retention time within the plant was five hours, then there would be a five hour interval between the raw and treated sampling. Similarly, if it was estimated that it took approximately one day for the water to travel from the plant to the distribution system site, this site would be sampled one day after the treated water from the plant.

Stringent DWSP sampling protocols were followed to ensure that all samples were taken in a uniform manner (see Appendix B).

Plant operating personnel routinely analyze parameters for process control (Table 2).

The following locations in the Guelph well supply were sampled:

1) treated water from the F.M. Woods pumping station and raw water collected from the surrounding well network;
2) raw and treated water from the University of Guelph pumping station;
3) raw and treated water from the Paisley Road well; and
4) two sites in the distribution.

All locations were sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), and organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons, specific pesticides and volatiles). Samples were analyzed for specific pesticides and chlorophenols twice a year in the spring and fall. Laboratory analyses were conducted at the Ministry of the Environment facilities in Rexdale, Ontario.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 contains information on delay time between raw and treated water sampling, flow rate, and treatment chemical dosages.

Table 4 is a summary break-down of the number of water samples analyzed by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 5 and 6. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

IN THIS REPORT, DISCUSSION IS LIMITED TO:

- **RESULTS FROM RAW AND DISTRIBUTED WATERS;**
- **THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES;**
- **POSITIVE ORGANIC PARAMETERS DETECTED; AND**
- **PERSISTENT TRACES OF ORGANIC PARAMETERS IN THE RAW WATER.**

In this report comments are combined for all sample locations for each parameter discussed. The water in the distribution system can be a mixture from many sources. Due to the many wells supplying this water system and the relatively few sample locations on DWSP, this report does not provide a complete picture of the drinking water quality.

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of

samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples.

Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were reported above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (FIELD)

It is desirable that the temperature of drinking water be less than 15°C. The palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The temperature of the delivered water may increase in the distribution system due to the warming effect of the soil in late summer and fall and/or as a result of higher temperatures in the source water.

Field temperature exceeded the ODWO Maximum Desirable Concentration of 15°C in 4 of 9 distributed water samples with a maximum reported value of 18.0°C.

CHEMISTRY (LAB)

Calcium exceeded the European Economic Community Aesthetic Guideline Level of 100 mg/L in 10 of 25 treated and distributed water samples with a maximum reported value of 111.5 mg/L.

Colour in drinking water may be due to the presence of natural or synthetic substances as well as certain metallic ions.

Colour exceeded the ODWO Maximum Desirable Concentration of 5 Hazen units (HZU) in 1 distribution water sample with a reported value of 7.5 HZU.

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in all 30 treated and distributed water samples with a maximum reported value of 953.0 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and would possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Aesthetic or Recommended Operational Guideline of 80-100 mg/L in all 30 treated and distributed water samples with a maximum reported value of 434.0 mg/L.

Magnesium exceeded the EEC Aesthetic Guideline Level of 30 mg/L in 9 of 30 treated and distributed water samples with a maximum reported value of 38.0 mg/L.

PH exceeded the ODWO Aesthetic or Recommended Operational Guideline of 6.5-8.5 pH units in 1 distribution water sample with a reported value of 8.58 pH units.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected.

CHLOROPHENOLS

The results of the chlorophenol scan showed that none were detected.

POLYAROMATIC HYDROCARBONS (PAH)

The results of the PAH scan showed that none were detected.

PESTICIDES & PCB

The results of the PCB scan showed that none were detected.

The results of the regular pesticide scan showed that one pesticide was detected at a trace level in one treated water sample. All samples from the associated raw water source had traces of the pesticide.

PHENOLICS

Phenolic compounds are present in the aquatic environment as a result of natural and/or industrial processes. The ODWOs recommend, as an operational guideline, that phenolic substances in drinking water not exceed 2.0 ug/L. This limit has been set primarily to prevent undesirable taste and odours, particularly in chlorinated water. No results were reported above trace levels.

SPECIFIC PESTICIDES

The results of the specific pesticides scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology.

Most samples from one of the reservoirs and its associated house contained traces of 1,1,1 trichloroethane and tetrachloroethylene. None was found in the raw water from those wells sampled.

Trihalomethanes (THMs) are produced during the water treatment process and will always occur in chlorinated waters. THMs are comprised of chloroform, chlorodibromomethane and dichlorobromomethane; bromoform occurs occasionally. Results are reported for the individual compounds as well as for total THMs. Only total THMs results are discussed.

Total THMs were found at positive levels in 16 of the 23 treated and distributed water samples analyzed. The maximum observed level was 21.4 ug/L. This was below the ODWO Maximum Acceptable Concentration of 350 ug/L.

CONCLUSIONS

The Guelph Well Supply, as sampled by DWSP, for the sample year 1990, produced good quality water and this was maintained in the distribution system.

No known health related guidelines were exceeded.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

WORKS #:	220000095
PLANT NAME:	GUELPH WELL SUPPLY
DISTRICT:	CAMBRIDGE
REGION:	WEST CENTRAL
DISTRICT OFFICER:	D. IRELAND
UTM #:	175000004800000
PLANT SUPERINTENDENT:	DOMENIC BASSO
ADDRESS:	CITY OF GUELPH F M WOODS PUMPING STATION 29 WATER WORKS PLACE GUELPH, ONTARIO N1E 6P7 ATT: MR JOHN SANVIDO (519)837-5627
MUNICIPALITY:	GUELPH
AUTHORITY:	MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	-	(X 1000 M3)
DESIGN CAPACITY:	90.460	(X 1000 M3/DAY)
RATED CAPACITY:	-	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
GUELPH	76,600

TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM

IN-PLANT MONITORING

Note - no data was provided on routine monitoring conducted on the Guelph Well Supply.

TABLE 3

GUELPH F.M. WOODS PUMPING STATION SAMPLE DAY CONDITIONS FOR 1990

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	TREATMENT CHEMICAL DOSAGE (MG/L) POST CHLORINATION CHLORINE
AUG 01	.50	37.000	.13
SEP 04	4.30	30.000	.15
OCT 01	2.50	.000	.50
NOV 01	12.00	31.000	.60
DEC 03	12.00	26.713	.60

GUELPH PAISLEY ROAD WELL SAMPLE DAY CONDITIONS FOR 1990

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	TREATMENT CHEMICAL DOSAGE (MG/L) POST CHLORINATION CHLORINE	IRON SEQUESTERING SODIUM SILICATE
AUG 01	.00	.800	1.02	6.00
SEP 04	.00	.700	1.30	1.00
OCT 01	.00	3.200	.60	4.00
NOV 01	.00	2.914	.54	1.06
DEC 03	.00	4.545	.54	1.06

UNIVERSITY OF GUELPH PUMPING STATION SAMPLE DAY CONDITIONS 1990

DATE	DELAY * TIME(HRS)	FLOW (1000M3)	TREATMENT CHEMICAL DOSAGE (MG/L) POST CHLORINATION CHLORINE
AUG 01	.66	.500	.34
SEP 04	.00	1.000	.23
OCT 01	.00	.000	.70
NOV 01	.00	1.500	.45
DEC 03	.00	2.273	.45

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH F.M. WOODS PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
BACTERIOLOGICAL									
FECAL COLIFORM MF	5	0	0	.	.	.	.	.	.
STANDRD PLATE CNT MF	.	.	.	5	0	0	5	0	0
TOTAL COLIFORM MF	5	4	0	.	.	.	.	.	.
T COLIFORM BCKGRD MF	5	5	0	.	.	.	.	.	.
*TOTAL GROUP BACTERIOLOGICAL	15	9	0	5	0	0	5	0	0
CHEMISTRY (FLD)									
FLD CHLORINE (COMB)	.	.	.	3	2	0	9	4	0
FLD CHLORINE FREE	.	.	.	4	4	0	9	6	0
FLD CHLORINE (TOTAL)	.	.	.	5	5	0	9	8	0
FLD PH	5	5	0	5	5	0	9	9	0
FLD TEMPERATURE	5	5	0	5	5	0	8	8	0
*TOTAL SCAN CHEMISTRY (FLD)	10	10	0	22	21	0	44	35	0
CHEMISTRY (LAB)									
ALKALINITY	5	5	0	5	5	0	9	9	0
CALCIUM	5	5	0	5	5	0	9	9	0
CYANIDE	5	0	0	5	0	0	.	.	.
CHLORIDE	5	5	0	5	5	0	9	9	0
COLOUR	5	2	3	5	0	5	9	1	7
CONDUCTIVITY	5	5	0	5	5	0	9	9	0
DISS ORG CARBON	5	5	0	5	5	0	9	9	0
FLUORIDE	5	5	0	5	5	0	9	9	0
HARDNESS	5	5	0	5	5	0	9	9	0
IONCAL	5	5	0	5	5	0	9	9	0
LANGELIERS INDEX	5	5	0	5	5	0	9	9	0
MAGNESIUM	5	5	0	5	5	0	9	9	0
SODIUM	5	5	0	5	5	0	9	9	0
AMMONIUM TOTAL	5	1	1	5	1	1	9	6	0
NITRITE	5	2	1	5	1	2	9	3	5
TOTAL NITRATES	5	5	0	5	5	0	9	9	0
NITROGEN TOT KJELD	5	4	1	5	5	0	9	8	1
PH	5	5	0	5	5	0	9	9	0
PHOSPHORUS FIL REACT	5	0	0	5	0	2	.	.	.
PHOSPHORUS TOTAL	5	0	2	5	0	2	.	.	.
SULPHATE	5	5	0	5	5	0	9	9	0
TURBIDITY	5	3	2	5	3	2	9	4	5
*TOTAL SCAN CHEMISTRY (LAB)	110	82	10	110	80	14	171	148	18

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH F.M. WOODS PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS									
SILVER	5	0	0	5	0	0	9	0	1
ALUMINUM	5	5	0	5	5	0	9	9	0
ARSENIC	5	0	4	5	0	3	9	0	6
BARIUM	5	5	0	5	5	0	9	9	0
BORON	5	3	2	5	4	1	9	9	0
BERYLLIUM	5	0	0	5	0	0	9	0	1
CADMIUM	5	0	5	5	0	5	9	0	9
COBALT	5	0	2	5	0	2	9	0	6
CHROMIUM	5	1	3	5	2	3	9	2	7
COPPER	5	1	4	5	0	5	9	9	0
IRON	5	0	1	5	0	0	9	0	7
MERCURY	5	0	0	5	0	2	.	.	.
MANGANESE	5	0	5	5	0	5	9	8	1
MOLYBDENUM	5	3	2	5	4	1	9	8	1
NICKEL	5	2	1	5	2	1	9	5	3
LEAD	5	0	5	5	0	5	9	5	4
ANTIMONY	5	2	3	5	2	3	9	4	5
SELENIUM	5	0	1	5	0	2	9	0	7
STRONTIUM	5	5	0	5	5	0	9	9	0
TITANIUM	5	5	0	5	5	0	9	9	0
THALLIUM	5	0	0	5	0	0	9	0	0
URANIUM	5	5	0	5	5	0	9	9	0
VANADIUM	5	0	3	5	0	3	9	0	7
ZINC	5	5	0	5	5	0	9	9	0
*TOTAL SCAN METALS	120	42	41	120	44	41	207	104	65
*TOTAL GROUP INORGANIC & PHYSICAL	240	134	51	252	145	55	422	287	83
CHLOROAROMATICS									
HEXACHLOROBUTADIENE	5	0	0	5	0	0	4	0	0
123 TRICHLOROBENZENE	5	0	0	5	0	0	4	0	0
1234 T-CHLOROBENZENE	5	0	0	5	0	0	4	0	0
1235 T-CHLOROBENZENE	5	0	0	5	0	0	4	0	0
124 TRICHLOROBENZENE	5	0	0	5	0	0	4	0	0
1245 T-CHLOROBENZENE	5	0	0	5	0	0	4	0	0
135 TRICHLOROBENZENE	5	0	0	5	0	0	4	0	0
HCB	5	0	0	5	0	0	4	0	0
HEXACHLOROETHANE	5	0	0	5	0	0	4	0	0
OCTACHLORODSTYRENE	5	0	0	5	0	0	4	0	0
PENTACHLOROBENZENE	5	0	0	5	0	0	4	0	0
236 TRICHLOROTOLUENE	5	0	0	5	0	0	4	0	0
245 TRICHLOROTOLUENE	5	0	0	5	0	0	4	0	0
26A TRICHLOROTOLUENE	5	0	0	5	0	0	4	0	0
*TOTAL SCAN CHLOROAROMATICS	70	0	0	70	0	0	56	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH F.M. WOODS PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
CHLOROPHENOLS									
234 TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.
2345 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.
2356 T-CHLOROPHENOL	2	0	0	2	0	0	.	.	.
245-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.
246-TRICHLOROPHENOL	2	0	0	2	0	0	.	.	.
PENTACHLOROPHENOL	2	0	0	2	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS	12	0	0	12	0	0	0	0	0
PAH									
PHENANTHRENE	5	0	0	5	0	0	.	.	.
ANTHRACENE	4	0	0	4	0	0	.	.	.
FLUORANTHENE	5	0	0	5	0	0	.	.	.
PYRENE	5	0	0	5	0	0	.	.	.
BENZO(A)ANTHRACENE	5	0	0	5	0	0	.	.	.
CHRYSENE	5	0	0	5	0	0	.	.	.
DIMETH. BENZ(A)ANTHR	4	0	0	4	0	0	.	.	.
BENZO(E) PYRENE	5	0	0	5	0	0	.	.	.
BENZO(B) FLUORANTHEN	5	0	0	5	0	0	.	.	.
PERYLENE	5	0	0	5	0	0	.	.	.
BENZO(K) FLUORANTHEN	5	0	0	5	0	0	.	.	.
BENZO(A) PYRENE	5	0	0	5	0	0	.	.	.
BENZO(G,H,I) PERYLEN	5	0	0	5	0	0	.	.	.
DIBENZO(A,H) ANTHRAC	5	0	0	5	0	0	.	.	.
INDENO(1,2,3-C,D) PY	5	0	0	5	0	0	.	.	.
BENZO(B) CHRYSENE	5	0	0	5	0	0	.	.	.
CORONENE	5	0	0	5	0	0	.	.	.
*TOTAL SCAN PAH	83	0	0	83	0	0	0	0	0
PESTICIDES & PCB									
ALDRIN	5	0	0	5	0	0	4	0	0
ALPHA BHC	5	0	0	5	0	0	4	0	0
BETA BHC	5	0	0	5	0	0	4	0	0
LINDANE	5	0	0	5	0	0	4	0	0
ALPHA CHLORDANE	5	0	0	5	0	0	4	0	0
GAMMA CHLORDANE	5	0	0	5	0	0	4	0	0
DIELDRIN	5	0	0	5	0	0	4	0	0
METHOXYCHLOR	5	0	0	5	0	0	4	0	0
ENDOSULFAN 1	5	0	0	5	0	0	4	0	0
ENDOSULFAN II	5	0	0	5	0	0	4	0	0
ENDRIN	5	0	0	5	0	0	4	0	0
ENDOSULFAN SULPHATE	5	0	0	5	0	0	4	0	0
HEPTACHLOR EPOXIDE	5	0	0	5	0	0	4	0	0
HEPTACHLOR	5	0	0	5	0	0	4	0	0
MIREX	5	0	0	5	0	0	4	0	0
OXYCHLORDANE	5	0	0	5	0	0	4	0	0
OPDDT	5	0	0	5	0	0	4	0	0
PCB	5	0	0	5	0	0	4	0	0
DDD	5	0	0	5	0	0	4	0	0
PPDDE	5	0	0	5	0	0	4	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH F.M. WOODS PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PPDDT	5	0	0	5	0	0	4	0	0
AMETRINE	5	0	0	5	0	0	.	.	.
ATRAZINE	5	0	0	5	0	0	.	.	.
ATRATONE	5	0	0	5	0	0	.	.	.
CYANAZINE (BLADEX)	5	0	0	5	0	0	.	.	.
DESETHYLATRAZINE	5	0	0	5	0	0	.	.	.
D-ETHYL SIMAZINE	5	0	0	5	0	0	.	.	.
PROMETONE	5	0	0	5	0	0	.	.	.
PROPAZINE	5	0	0	5	0	0	.	.	.
PROMETRYNE	5	0	0	5	0	0	.	.	.
METRIBUZIN (SENCOR)	5	0	0	5	0	0	.	.	.
SIMAZINE	5	0	0	5	0	0	.	.	.
ALACHLOR (LASSO)	5	0	0	5	0	0	.	.	.
METOLACHLOR	5	0	0	5	0	0	.	.	.
HEXACLCYCLOPENTADIEN	2	0	0	2	0	0	1	0	0
*TOTAL SCAN PESTICIDES & PCB	172	0	0	172	0	0	85	0	0
PHENOLICS									
PHENOLICS	5	0	2	5	0	2	.	.	.
*TOTAL SCAN PHENOLICS	5	0	2	5	0	2	0	0	0
SPECIFIC PESTICIDES									
TOXAPHENE	5	0	0	5	0	0	4	0	0
2,4,5-T	2	0	0	2	0	0	.	.	.
2,4-D	2	0	0	2	0	0	.	.	.
2,4-DB	2	0	0	2	0	0	.	.	.
2,4 D PROPIONIC ACID	2	0	0	2	0	0	.	.	.
DICAMBA	2	0	0	2	0	0	.	.	.
PICHLORAM	0	0	0	0	0	0	.	.	.
SILVEX	2	0	0	2	0	0	.	.	.
DIAZINON	2	0	0	2	0	0	.	.	.
DICHLOROVOS	2	0	0	2	0	0	.	.	.
CHLORPYRIFOS	2	0	0	2	0	0	.	.	.
ETHION	2	0	0	2	0	0	.	.	.
AZINPHOS-METHYL	0	0	0	0	0	0	.	.	.
MALATHION	2	0	0	2	0	0	.	.	.
MEVINPHOS	2	0	0	2	0	0	.	.	.
METHYL PARATHION	2	0	0	2	0	0	.	.	.
METHYLTRITHION	2	0	0	2	0	0	.	.	.
PARATHION	2	0	0	2	0	0	.	.	.
PHORATE	2	0	0	2	0	0	.	.	.
RELDAN	2	0	0	2	0	0	.	.	.
RONNEL	2	0	0	2	0	0	.	.	.
AMINOCARB	0	0	0	0	0	0	.	.	.
BENOMYL	0	0	0	0	0	0	.	.	.
BUX	0	0	0	0	0	0	.	.	.
CARBOFURAN	2	0	0	2	0	0	.	.	.
CICP	2	0	0	2	0	0	.	.	.
DIALLATE	2	0	0	2	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH F.M. WOODS PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
EPTAM	2	0	0	2	0	0	.	.	.
IPC	2	0	0	2	0	0	.	.	.
PROPOXUR	2	0	0	2	0	0	.	.	.
CARBARYL	2	0	0	2	0	0	.	.	.
BUTYLATE	2	0	0	2	0	0	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES	57	0	0	57	0	0	4	0	0
VOLATILES									
BENZENE	5	0	0	5	0	0	5	0	0
TOLUENE	5	0	0	5	0	0	5	0	0
ETHYLBENZENE	5	0	1	5	0	0	5	0	1
P-XYLENE	5	0	0	5	0	0	5	0	0
M-XYLENE	5	0	0	5	0	0	5	0	0
O-XYLENE	5	0	0	5	0	0	5	0	0
STYRENE	5	0	2	5	0	2	5	0	2
1,1 DICHLOROETHYLENE	5	0	0	5	0	0	5	0	0
METHYLENE CHLORIDE	5	0	0	5	0	0	5	0	0
T1,2DICHLOROETHYLENE	5	0	0	5	0	0	5	0	0
1,1 DICHLOROETHANE	5	0	0	5	0	0	5	0	0
CHLOROFORM	5	0	0	5	1	4	5	0	5
111, TRICHLOROETHANE	5	0	0	5	0	0	5	0	0
1,2 DICHLOROETHANE	5	0	0	5	0	0	5	0	0
CARBON TETRACHLORIDE	5	0	0	5	0	0	5	0	0
1,2 DICHLOROPROPANE	5	0	0	5	0	0	5	0	0
TRICHLOROETHYLENE	5	0	0	5	0	0	5	0	0
DICHLOROBROMOMETHANE	5	0	0	5	3	2	5	3	2
112 TRICHLOROETHANE	5	0	0	5	0	0	5	0	0
CHLORODIBROMOMETHANE	5	0	0	5	3	1	5	3	1
T-CHLOROETHYLENE	5	0	0	5	0	0	5	0	0
BROMOFORM	5	0	0	5	3	1	5	3	1
1122 T-CHLOROETHANE	5	0	0	5	0	0	5	0	0
CHLOROBENZENE	5	0	0	5	0	0	5	0	0
1,4 DICHLOROBENZENE	5	0	0	5	0	0	5	0	0
1,3 DICHLOROBENZENE	5	0	0	5	0	0	5	0	0
1,2 DICHLOROBENZENE	5	0	0	5	0	0	5	0	0
ETHLYENE DIBROMIDE	5	0	0	5	0	0	5	0	0
TOTL TRIHALOMETHANES	5	0	0	5	3	1	5	3	1
*TOTAL SCAN VOLATILES	145	0	3	145	13	11	145	12	13
*TOTAL GROUP ORGANIC	544	0	5	544	13	13	290	12	13

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
BACTERIOLOGICAL									
FECAL COLIFORM MF	3	0	0	.	.	.	.	.	.
STANDRD PLATE CNT MF	.	.	.	5	0	0	4	0	0
TOTAL COLIFORM MF	3	1	0	.	.	.	.	.	.
T COLIFORM BCKGRD MF	3	2	0	.	.	.	.	.	.
*TOTAL GROUP BACTERIOLOGICAL	9	3	0	5	0	0	4	0	0
CHEMISTRY (FLD)									
FLD CHLORINE (COMB)	.	.	.	2	1	0	10	2	0
FLD CHLORINE FREE	.	.	.	3	3	0	10	6	0
FLD CHLORINE (TOTAL)	.	.	.	3	3	0	10	6	0
FLD PH	3	3	0	5	5	0	10	10	0
FLD TEMPERATURE	3	3	0	5	5	0	10	10	0
*TOTAL SCAN CHEMISTRY (FLD)	6	6	0	18	17	0	50	34	0
CHEMISTRY (LAB)									
ALKALINITY	3	3	0	5	5	0	10	10	0
CALCIUM	3	3	0	5	5	0	10	10	0
CYANIDE	3	0	0	5	0	0	.	.	.
CHLORIDE	3	3	0	5	5	0	10	10	0
COLOUR	3	3	0	5	0	5	10	0	9
CONDUCTIVITY	3	3	0	5	5	0	10	10	0
DISS ORG CARBON	3	3	0	5	5	0	10	10	0
FLUORIDE	3	3	0	5	5	0	10	10	0
HARDNESS	3	3	0	5	5	0	10	10	0
IONCAL	3	3	0	5	5	0	10	10	0
LANGELIERS INDEX	3	3	0	5	5	0	10	10	0
MAGNESIUM	3	3	0	5	5	0	10	10	0
SODIUM	3	3	0	5	5	0	10	10	0
AMMONIUM TOTAL	3	2	0	5	1	1	10	3	3
NITRITE	3	2	1	5	1	3	10	4	4
TOTAL NITRATES	3	3	0	5	5	0	10	10	0
NITROGEN TOT KJELD	3	1	2	5	3	2	10	7	3
PH	3	3	0	5	5	0	10	10	0
PHOSPHORUS FIL REACT	3	0	2	5	0	2	.	.	.
PHOSPHORUS TOTAL	3	0	1	5	0	2	.	.	.
SULPHATE	3	3	0	5	5	0	10	10	0
TURBIDITY	3	3	0	5	4	1	10	8	2
*TOTAL SCAN CHEMISTRY (LAB)	66	53	6	110	79	16	190	162	21

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
METALS									
SILVER	3	0	0	5	0	0	10	3	1
ALUMINUM	3	3	0	5	5	0	10	10	0
ARSENIC	3	2	1	5	0	4	10	0	8
BARIUM	3	3	0	5	5	0	10	10	0
BORON	3	2	1	5	4	1	10	7	3
BERYLLIUM	3	0	1	5	0	0	10	0	2
CADMIUM	3	0	1	5	0	4	10	0	10
COBALT	3	0	2	5	1	3	10	1	7
CHROMIUM	3	1	2	5	2	3	10	0	8
COPPER	3	0	3	5	0	5	10	10	0
IRON	3	3	0	5	0	4	10	0	10
MERCURY	3	0	0	5	0	1	.	.	.
MANGANESE	3	3	0	5	5	0	10	10	0
MOLYBDENUM	3	3	0	5	5	0	10	10	0
NICKEL	3	2	1	5	3	1	10	8	0
LEAD	3	0	3	5	0	5	10	10	0
ANTIMONY	3	1	2	5	1	4	10	8	2
SELENIUM	3	0	1	5	0	3	10	0	8
STRONTIUM	3	3	0	5	5	0	10	10	0
TITANIUM	3	3	0	5	5	0	10	10	0
THALLIUM	3	0	0	5	0	0	10	0	0
URANIUM	3	3	0	5	5	0	10	9	1
VANADIUM	3	0	2	5	0	4	10	0	8
ZINC	3	3	0	5	5	0	10	10	0
*TOTAL SCAN METALS	72	35	20	120	51	42	230	126	68
*TOTAL GROUP INORGANIC & PHYSICAL	144	94	26	248	147	58	470	322	89
CHLOROAROMATICS									
HEXACHLOROBUTADIENE	3	0	0	5	0	0	5	0	0
123 TRICHLOROBENZENE	3	0	0	5	0	0	5	0	0
1234 T-CHLOROBENZENE	3	0	0	5	0	0	5	0	0
1235 T-CHLOROBENZENE	3	0	0	5	0	0	5	0	0
124 TRICHLOROBENZENE	3	0	0	5	0	0	5	0	0
1245 T-CHLOROBENZENE	3	0	0	5	0	0	5	0	0
135 TRICHLOROBENZENE	3	0	0	5	0	0	5	0	0
HCB	3	0	0	5	0	0	5	0	0
HEXACHLOROETHANE	3	0	0	5	0	0	5	0	0
OCTACHLOROSTYRENE	3	0	0	5	0	0	5	0	0
PENTACHLOROBENZENE	3	0	0	5	0	0	5	0	0
236 TRICHLOROTOLUENE	3	0	0	5	0	0	5	0	0
245 TRICHLOROTOLUENE	3	0	0	5	0	0	5	0	0
26A TRICHLOROTOLUENE	3	0	0	5	0	0	5	0	0
*TOTAL SCAN CHLOROAROMATICS	42	0	0	70	0	0	70	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW			TREATED			SITE 1		
	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
CHLOROPHENOLS									
234 TRICHLOROPHENOL	1	0	0	2	0	0	.	.	.
2345 T-CHLOROPHENOL	1	0	0	2	0	0	.	.	.
2356 T-CHLOROPHENOL	1	0	0	2	0	0	.	.	.
245-TRICHLOROPHENOL	1	0	0	2	0	0	.	.	.
246-TRICHLOROPHENOL	1	0	0	2	0	0	.	.	.
PENTACHLOROPHENOL	1	0	0	2	0	0	.	.	.
*TOTAL SCAN CHLOROPHENOLS	6	0	0	12	0	0	0	0	0
PAH									
PHENANTHRENE	3	0	0	5	0	0	.	.	.
ANTHRACENE	2	0	0	4	0	0	.	.	.
FLUORANTHENE	3	0	0	5	0	0	.	.	.
PYRENE	3	0	0	5	0	0	.	.	.
BENZO(A)ANTHRACENE	3	0	0	5	0	0	.	.	.
CHRYSENE	3	0	0	5	0	0	.	.	.
DIMETH. BENZ(A)ANTHR	2	0	0	4	0	0	.	.	.
BENZO(E) PYRENE	3	0	0	5	0	0	.	.	.
BENZO(B) FLUORANTHEN	3	0	0	5	0	0	.	.	.
PERYLENE	3	0	0	5	0	0	.	.	.
BENZO(K) FLUORANTHEN	3	0	0	5	0	0	.	.	.
BENZO(A) PYRENE	3	0	0	5	0	0	.	.	.
BENZO(G,H,1) PERYLEN	3	0	0	5	0	0	.	.	.
DIBENZO(A,H) ANTHRAC	3	0	0	5	0	0	.	.	.
INDENO(1,2,3-C,D) PY	3	0	0	5	0	0	.	.	.
BENZO(B) CHRYSENE	3	0	0	5	0	0	.	.	.
CORONENE	3	0	0	5	0	0	.	.	.
*TOTAL SCAN PAH	49	0	0	83	0	0	0	0	0
PESTICIDES & PCB									
ALDRIN	3	0	0	5	0	0	5	0	0
ALPHA BHC	3	0	0	5	0	0	5	0	0
BETA BHC	3	0	0	5	0	0	5	0	0
LINDANE	3	0	0	5	0	0	5	0	0
ALPHA CHLORDANE	3	0	0	5	0	0	5	0	0
GAMMA CHLORDANE	3	0	0	5	0	0	5	0	0
DIELDRIN	3	0	0	5	0	0	5	0	0
METHOXYCHLOR	3	0	0	5	0	0	5	0	0
ENDOSULFAN 1	3	0	0	5	0	0	5	0	0
ENDOSULFAN II	3	0	0	5	0	0	5	0	0
ENDRIN	3	0	0	5	0	0	5	0	0
ENDOSULFAN SULPHATE	3	0	0	5	0	0	5	0	0
HEPTACHLOR EPOXIDE	3	0	0	5	0	0	5	0	0
HEPTACHLOR	3	0	0	5	0	0	5	0	0
MIREX	3	0	0	5	0	0	5	0	0
OXYCHLORDANE	3	0	0	5	0	0	5	0	0
OPDDT	3	0	0	5	0	0	5	0	0
PCB	3	0	0	5	0	0	5	0	0
DDD	3	0	0	5	0	0	5	0	0
PPDDE	3	0	0	5	0	0	5	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL
SUMMARY TABLE OF RESULTS (1990)

	RAW			TREATED			SITE 1		
SCAN PARAMETER	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE	TOTAL	POSITIVE	TRACE
PPDDT	3	0	0	5	0	0	5	0	0
AMETRINE	3	0	0	5	0	0	.	.	.
ATRAZINE	3	0	3	5	0	1	.	.	.
ATRATONE	3	0	0	5	0	0	.	.	.
CYANAZINE (BLADEX)	3	0	0	5	0	0	.	.	.
DESETHYLATRAZINE	3	0	0	5	0	0	.	.	.
D-ETHYL SIMAZINE	3	0	0	5	0	0	.	.	.
PROMETONE	3	0	0	5	0	0	.	.	.
PROPAZINE	3	0	0	5	0	0	.	.	.
PROMETRYNE	3	0	0	5	0	0	.	.	.
METRIBUZIN (SENCOR)	3	0	0	5	0	0	.	.	.
SIMAZINE	3	0	0	5	0	0	.	.	.
ALACHLOR (LASSO)	3	0	0	5	0	0	.	.	.
METOLACHLOR	3	0	0	5	0	0	.	.	.
HEXACLCYCLOPENTADIEN	2	0	0	2	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB	104	0	3	172	0	1	107	0	0
PHENOLICS									
PHENOLICS	3	1	0	5	0	2	.	.	.
*TOTAL SCAN PHENOLICS	3	1	0	5	0	2	0	0	0
SPECIFIC PESTICIDES									
TOXAPHENE	3	0	0	5	0	0	5	0	0
2,4,5-T	1	0	0	2	0	0	.	.	.
2,4-D	1	0	0	2	0	0	.	.	.
2,4-DB	1	0	0	2	0	0	.	.	.
2,4 D PROPIONIC ACID	1	0	0	2	0	0	.	.	.
DICAMBA	1	0	0	2	0	0	.	.	.
PICHLORAM	0	0	0	0	0	0	.	.	.
SILVEX	1	0	0	2	0	0	.	.	.
DIAZINON	1	0	0	2	0	0	.	.	.
DICHLOROVOS	1	0	0	2	0	0	.	.	.
CHLORPYRIFOS	1	0	0	2	0	0	.	.	.
ETHION	1	0	0	2	0	0	.	.	.
AZINPHOS-METHYL	0	0	0	0	0	0	.	.	.
MALATHION	1	0	0	2	0	0	.	.	.
MEVINPHOS	1	0	0	2	0	0	.	.	.
METHYL PARATHION	1	0	0	2	0	0	.	.	.
METHYLTRITHION	1	0	0	2	0	0	.	.	.
PARATHION	1	0	0	2	0	0	.	.	.
PHORATE	1	0	0	2	0	0	.	.	.
RELDAN	1	0	0	2	0	0	.	.	.
RONNEL	1	0	0	2	0	0	.	.	.
AMINOCARB	0	0	0	0	0	0	.	.	.
BENOMYL	0	0	0	0	0	0	.	.	.
BUX	0	0	0	0	0	0	.	.	.
CARBOFURAN	1	0	0	2	0	0	.	.	.
CICP	1	0	0	2	0	0	.	.	.
DIALLATE	1	0	0	2	0	0	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE	SITE 1 TOTAL	SITE 1 POSITIVE	SITE 1 TRACE
EPTAM	1	0	0	2	0	0	.	.	.
IPC	1	0	0	2	0	0	.	.	.
PROPOXUR	1	0	0	2	0	0	.	.	.
CARBARYL	1	0	0	2	0	0	.	.	.
BUTYLATE	1	0	0	2	0	0	.	.	.
*TOTAL SCAN SPECIFIC PESTICIDES	29	0	0	57	0	0	5	0	0
VOLATILES									
BENZENE	3	0	0	5	0	0	5	0	0
TOLUENE	3	0	0	5	0	0	5	0	0
ETHYLBENZENE	3	0	2	5	0	2	5	0	1
P-XYLENE	3	0	0	5	0	0	5	0	0
M-XYLENE	3	0	0	5	0	0	5	0	0
O-XYLENE	3	0	0	5	0	0	5	0	0
STYRENE	3	0	2	5	0	1	5	0	2
1,1 DICHLOROETHYLENE	3	0	0	5	0	0	5	0	0
METHYLENE CHLORIDE	3	0	0	5	0	0	5	0	0
T1,2DICHLOROETHYLENE	3	0	0	5	0	0	5	0	0
1,1 DICHLOROETHANE	3	0	0	5	0	0	5	0	0
CHLOROFORM	3	0	0	5	3	2	5	3	2
111, TRICHLOROETHANE	3	0	0	5	0	4	5	0	4
1,2 DICHLOROETHANE	3	0	0	5	0	0	5	0	0
CARBON TETRACHLORIDE	3	0	0	5	0	0	5	0	0
1,2 DICHLOROPROPANE	3	0	0	5	0	0	5	0	0
TRICHLOROETHYLENE	3	0	0	5	0	0	5	0	2
DICHLOROBROMOMETHANE	3	0	0	5	4	1	5	4	1
112 TRICHLOROETHANE	3	0	0	5	0	0	5	0	0
CHLORODIBROMOMETHANE	3	0	0	5	4	1	5	4	1
T-CHLOROETHYLENE	3	0	0	5	0	3	5	0	3
BROMOFORM	3	0	0	5	4	1	5	4	1
1122 T-CHLOROETHANE	3	0	0	5	0	0	5	0	0
CHLOROBENZENE	3	0	0	5	0	0	5	0	0
1,4 DICHLOROBENZENE	3	0	0	5	0	0	5	0	0
1,3 DICHLOROBENZENE	3	0	0	5	0	0	5	0	0
1,2 DICHLOROBENZENE	3	0	0	5	0	0	5	0	0
ETHLYENE DIBROMIDE	3	0	0	5	0	0	5	0	0
TOTL TRIHALOMETHANES	3	0	0	5	4	1	5	4	1
*TOTAL SCAN VOLATILES	87	0	4	145	19	16	145	19	18
*TOTAL GROUP ORGANIC	320	1	7	544	19	19	327	19	18

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
BACTERIOLOGICAL						
FECAL COLIFORM MF	4	0	0	.	.	.
STANDRD PLATE CNT MF	.	.	.	5	1	0
TOTAL COLIFORM MF	4	1	0	.	.	.
T COLIFORM BCKGRD MF	4	1	0	.	.	.
*TOTAL GROUP BACTERIOLOGICAL	12	2	0	5	1	0
CHEMISTRY (FLD)						
FLD CHLORINE (COMB)	.	.	.	3	2	0
FLD CHLORINE FREE	.	.	.	5	5	0
FLD CHLORINE (TOTAL)	.	.	.	5	5	0
FLD PH	5	5	0	5	5	0
FLD TEMPERATURE	5	5	0	5	5	0
*TOTAL SCAN CHEMISTRY (FLD)	10	10	0	23	22	0
CHEMISTRY (LAB)						
ALKALINITY	5	5	0	5	5	0
CALCIUM	5	5	0	5	5	0
CYANIDE	5	0	0	5	0	0
CHLORIDE	5	5	0	5	5	0
COLOUR	5	0	5	5	0	5
CONDUCTIVITY	5	5	0	5	5	0
DISS ORG CARBON	5	5	0	5	5	0
FLUORIDE	5	5	0	5	5	0
HARDNESS	5	5	0	5	5	0
IONCAL	5	5	0	5	5	0
LANGELIERS INDEX	5	5	0	5	5	0
MAGNESIUM	5	5	0	5	5	0
SODIUM	5	5	0	5	5	0
AMMONIUM TOTAL	5	4	0	5	3	1
NITRITE	5	2	3	5	1	2
TOTAL NITRATES	5	5	0	5	5	0
NITROGEN TOT KJELD	5	3	2	5	1	4
PH	5	5	0	5	5	0
PHOSPHORUS FIL REACT	5	0	3	5	0	4
PHOSPHORUS TOTAL	5	0	2	5	0	4
SULPHATE	5	5	0	5	5	0
TURBIDITY	5	3	2	5	3	2
*TOTAL SCAN CHEMISTRY (LAB)	110	82	17	110	78	22

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
METALS						
SILVER	5	0	0	5	0	1
ALUMINUM	5	5	0	5	5	0
ARSENIC	5	1	3	5	1	3
BARIUM	5	5	0	5	5	0
BORON	5	4	1	5	5	0
BERYLLIUM	5	0	0	5	0	1
CADMIUM	5	0	4	5	0	5
COBALT	5	0	3	5	0	4
CHROMIUM	5	1	4	5	2	3
COPPER	5	0	5	5	0	5
IRON	5	0	4	5	0	4
MERCURY	5	1	0	4	0	1
MANGANESE	5	5	0	5	5	0
MOLYBDENUM	5	5	0	5	5	0
NICKEL	5	2	2	5	2	2
LEAD	5	5	0	5	5	0
ANTIMONY	5	2	3	5	2	3
SELENIUM	5	0	1	5	0	3
STRONTIUM	5	5	0	5	5	0
TITANIUM	5	5	0	5	5	0
THALLIUM	5	0	0	5	0	0
URANIUM	5	5	0	5	5	0
VANADIUM	5	0	4	5	0	4
ZINC	5	5	0	5	5	0
*TOTAL SCAN METALS	120	56	34	119	57	39
*TOTAL GROUP INORGANIC & PHYSICAL	240	148	51	252	157	61
CHLOROAROMATICS						
HEXACHLOROBUTADIENE	5	0	0	5	0	0
123 TRICHLOROBENZENE	5	0	0	5	0	0
1234 T-CHLOROBENZENE	5	0	0	5	0	0
1235 T-CHLOROBENZENE	5	0	0	5	0	0
124 TRICHLOROBENZENE	5	0	0	5	0	0
1245 T-CHLOROBENZENE	5	0	0	5	0	0
135 TRICHLOROBENZENE	5	0	0	5	0	0
HCB	5	0	0	5	0	0
HEXACHLOROETHANE	5	0	0	5	0	0
OCTACHLOROSTYRENE	5	0	0	5	0	0
PENTACHLOROBENZENE	5	0	0	5	0	0
236 TRICHLOROTOLUENE	5	0	0	5	0	0
245 TRICHLOROTOLUENE	5	0	0	5	0	0
26A TRICHLOROTOLUENE	5	0	0	5	0	0
*TOTAL SCAN CHLOROAROMATICS	70	0	0	70	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
CHLOROPHENOLS						
234 TRICHLOROPHENOL	2	0	0	2	0	0
2345 T-CHLOROPHENOL	2	0	0	2	0	0
2356 T-CHLOROPHENOL	2	0	0	2	0	0
245-TRICHLOROPHENOL	2	0	0	2	0	0
246-TRICHLOROPHENOL	2	0	0	2	0	0
PENTACHLOROPHENOL	2	0	0	2	0	0
*TOTAL SCAN CHLOROPHENOLS	12	0	0	12	0	0
PAH						
PHENANTHRENE	4	0	0	5	0	0
ANTHRACENE	4	0	0	4	0	0
FLUORANTHENE	4	0	0	5	0	0
PYRENE	4	0	0	5	0	0
BENZO(A)ANTHRACENE	4	0	0	5	0	0
CHRYSENE	4	0	0	5	0	0
DIMETH. BENZ(A)ANTHR	4	0	0	4	0	0
BENZO(E) PYRENE	4	0	0	5	0	0
BENZO(B) FLUORANTHEN	4	0	0	5	0	0
PERYLENE	4	0	0	5	0	0
BENZO(K) FLUORANTHEN	4	0	0	5	0	0
BENZO(A) PYRENE	4	0	0	5	0	0
BENZO(G,H,I) PERYLEN	4	0	0	5	0	0
DIBENZO(A,H) ANTHRAC	4	0	0	5	0	0
INDENO(1,2,3-C,D) PY	4	0	0	5	0	0
BENZO(B) CHRYSENE	4	0	0	5	0	0
CORONENE	4	0	0	5	0	0
*TOTAL SCAN PAH	68	0	0	83	0	0
PESTICIDES & PCB						
ALDRIN	5	0	0	5	0	0
ALPHA BHC	5	0	0	5	0	0
BETA BHC	5	0	0	5	0	0
LINDANE	5	0	0	5	0	0
ALPHA CHLORDANE	5	0	0	5	0	0
GAMMA CHLORDANE	5	0	0	5	0	0
DIELDRIN	5	0	0	5	0	0
METHOXYCHLOR	5	0	0	5	0	0
ENDOSULFAN 1	5	0	0	5	0	0
ENDOSULFAN II	5	0	0	5	0	0
ENDRIN	5	0	0	5	0	0
ENDOSULFAN SULPHATE	5	0	0	5	0	0
HEPTACHLOR EPOXIDE	5	0	0	5	0	0
HEPTACHLOR	5	0	0	5	0	0
MIREX	5	0	0	5	0	0
OXYCHLORDANE	5	0	0	5	0	0
OPDDT	5	0	0	5	0	0
PCB	5	0	0	5	0	0
DDD	5	0	0	5	0	0
PPDDE	5	0	0	5	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
PPDDT	5	0	0	5	0	0
AMETRINE	5	0	0	5	0	0
ATRAZINE	5	0	0	5	0	0
ATRATONE	5	0	0	5	0	0
CYANAZINE (BLADEX)	5	0	0	5	0	0
DESETHYLATRAZINE	5	0	0	5	0	0
D-ETHYL SIMAZINE	5	0	0	5	0	0
PROMETONE	5	0	0	5	0	0
PROPAZINE	5	0	0	5	0	0
PROMETRYNE	5	0	0	5	0	0
METRIBUZIN (SENCOR)	5	0	0	5	0	0
SIMAZINE	5	0	0	5	0	0
ALACHLOR (LASSO)	5	0	0	5	0	0
METOLACHLOR	5	0	0	5	0	0
HEXACLCYCLOPENTADIEN	2	0	0	2	0	0
*TOTAL SCAN PESTICIDES & PCB	172	0	0	172	0	0
PHENOLICS						
PHENOLICS	5	0	3	5	0	0
*TOTAL SCAN PHENOLICS	5	0	3	5	0	0
SPECIFIC PESTICIDES						
TOXAPHENE	5	0	0	5	0	0
2,4,5-T	2	0	0	2	0	0
2,4-D	2	0	0	2	0	0
2,4-DB	2	0	0	2	0	0
2,4 D PROPIONIC ACID	2	0	0	2	0	0
DICAMBA	2	0	0	2	0	0
PICHLORAM	0	0	0	0	0	0
SILVEX	2	0	0	2	0	0
DIAZINON	2	0	0	2	0	0
DICHLOROVOS		0	0	2	0	0
CHLORPYRIFOS		0	0	2	0	0
ETHION	2	0	0	2	0	0
AZINPHOS-METHYL	0	0	0	0	0	0
MALATHION	2	0	0	2	0	0
MEVINPHOS	2	0	0	2	0	0
METHYL PARATHION	2	0	0	2	0	0
METHYLTRITHION	2	0	0	2	0	0
PARATHION	2	0	0	2	0	0
PHORATE	2	0	0	2	0	0
RELDAN	2	0	0	2	0	0
ROWNEL	2	0	0	2	0	0
AMINOCARB	0	0	0	0	0	0
BENOMYL	0	0	0	0	0	0
BUX	0	0	0	0	0	0
CARBOFURAN	2	0	0	2	0	0
CICP	2	0	0	2	0	0
DIALLATE	2	0	0	2	0	0

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION
SUMMARY TABLE OF RESULTS (1990)

SCAN PARAMETER	RAW TOTAL	RAW POSITIVE	RAW TRACE	TREATED TOTAL	TREATED POSITIVE	TREATED TRACE
EPTAM	2	0	0	2	0	0
IPC	2	0	0	2	0	0
PROPOXUR	2	0	0	2	0	0
CARBARYL	2	0	0	2	0	0
BUTYLATE	2	0	0	2	0	0
*TOTAL SCAN SPECIFIC PESTICIDES	57	0	0	57	0	0
VOLATILES						
BENZENE	4	0	0	3	0	0
TOLUENE	4	0	0	3	0	0
ETHYLBENZENE	4	0	1	3	0	0
P-XYLENE	4	0	0	3	0	0
M-XYLENE	4	0	0	3	0	0
O-XYLENE	4	0	0	3	0	0
STYRENE	4	0	1	3	0	1
1,1 DICHLOROETHYLENE	4	0	0	3	0	0
METHYLENE CHLORIDE	4	0	0	3	0	0
T1,2DICHLOROETHYLENE	4	0	0	3	0	0
1,1 DICHLOROETHANE	4	0	0	3	0	0
CHLOROFORM	4	0	4	3	1	2
111, TRICHLOROETHANE	4	0	0	3	0	0
1,2 DICHLOROETHANE	4	0	0	3	0	0
CARBON TETRACHLORIDE	4	0	0	3	0	0
1,2 DICHLOROPROPANE	4	0	0	3	0	0
TRICHLOROETHYLENE	4	0	0	3	0	0
DICHLOROBROMOMETHANE	4	0	0	3	2	1
112 TRICHLOROETHANE	4	0	0	3	0	0
CHLORODIBROMOMETHANE	4	0	0	3	2	1
T-CHLOROETHYLENE	4	0	0	3	0	0
BROMOFORM	4	0	0	3	2	1
1122 T-CHLOROETHANE	4	0	0	3	0	0
CHLOROBENZENE	4	0	0	3	0	0
1,4 DICHLOROBENZENE	4	0	0	3	0	0
1,3 DICHLOROBENZENE	4	0	0	3	0	0
1,2 DICHLOROBENZENE	4	0	0	3	0	0
ETHLYENE DIBROMIDE	4	0	0	3	0	0
TOTL TRIHALOMETHANES	4	0	0	3	2	1
*TOTAL SCAN VOLATILES	116	0	6	87	9	7
*TOTAL GROUP ORGANIC	500	0	9	486	9	7

KEY TO TABLE 5 and 6

A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
1. Maximum Acceptable Concentration (MAC)
1+. MAC for Total Trihalomethanes
2. Interim Maximum Acceptable Concentration (IMAC)
3. Aesthetic Objective (AO)
3*. AO for Total Xylenes
4. Recommended Operational Guideline

B HEALTH & WELFARE CANADA (H&W)
1. Maximum Acceptable Concentration (MAC)
2. Proposed MAC
3. Interim MAC
4. Aesthetic Objective (AO)

C WORLD HEALTH ORGANIZATION (WHO)
1. Guideline Value (GV)
2. Tentative GV
3. Aesthetic GV

D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
2. Suggested No-Adverse Effect Level (SNAEL)
3. Lifetime Health Advisory
4. EPA Ambient Water Quality Criteria
4T. EPA Ambient Water Quality Criteria for Total PAH

F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
2. Aesthetic Guideline Level
3. Maximum Admissable Concentration (MADC)

G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE

I NEW YORK STATE AMBIENT WATER GUIDELINE

N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurement Amount
<T	Greater Than Detection Limit But Not Confident (SEE INTERPRETATION OF RESULTS ABOVE)
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!IV	No Data: Inverted Septum
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!QU	No Data: Quality Control Unacceptable
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RE	No Data: Received Empty
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
!TX	No Data: Time Expired
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample
RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant

UCR		Unreliable: Could Not Confirm By Reanalysis
UCS		Unreliable: Contamination Suspected
UIN		Unreliable: Indeterminate Interference
XP		Positive After X Number Of Hours
T#	(T06)	Result Taken After # Hours

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
RAW	TREATED	SITE 1	
		STANDING	FREE FLOW
BACTERIOLOGICAL			
FECAL COLIFORM MF (CT/100ML)		**DET'N LIMIT = 0**	**GUIDELINE = 0 (A1)**
AUG	BDL	.	.	.
SEP	0	.	.	.
OCT	0	.	.	.
NOV	0	.	.	.
DEC	0	.	.	.
STANDRD PLATE CNT MF (COUNT/ML)		**DET'N LIMIT = 0**	**GUIDELINE = 500/ML (A3)**
AUG	.	0 <=>	.	3 <=>
SEP	.	3 <=>	.	0 <=>
OCT	.	1 <=>	.	0 <=>
NOV	.	2 <=>	.	0 <=>
DEC	.	1 <=>	.	1 <=>
TOTAL COLIFORM MF (CT/100ML)		**DET'N LIMIT = D**	**GUIDELINE = 5/100ML(A1)**
AUG	4 <=>	.	.	.
SEP	4	.	.	.
OCT	5	.	.	.
NOV	2	.	.	.
DEC	5	.	.	.
T COLIFORM BCKGRD MF (CT/100ML)		**DET'N LIMIT = 0**	**GUIDELINE = N/A**
AUG	1240	.	.	.
SEP	52	.	.	.
OCT	42	.	.	.
NOV	14	.	.	.
DEC	170	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.020	.	.000
SEP	.	.	.080	.080
OCT	.	.	.000	.000
NOV	.	.000	.100,	.100
DEC	.	.060	.000	.000
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.	.	.000
SEP	.	.100	.000	.000
OCT	.	.300	.100	.100
NOV	.	.100	.100	.100
DEC	.	.040	.100	.100
FLD CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.020	.	.000
SEP	.	.100	.080	.080
OCT	.	.300	.100	.100
NOV	.	.100	.200	.200
DEC	.	.100	.100	.100
FLD PH (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
AUG	7.600	7.600	.	7.400
SEP	7.400	7.600	7.400	7.400
OCT	7.600	7.800	7.600	7.600
NOV	7.400	7.600	7.800	7.600
DEC	7.600	7.600	7.600	7.600
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A	GUIDELINE = 15 (A3)
AUG	10.000	11.000	.	17.000
SEP	10.000	11.000	18.000	18.000
OCT	10.000	11.000	17.000	14.000
NOV	8.000	10.000	17.000	13.000
DEC	8.000	9.000	16.000	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (LAB)				
ALKALINITY (MG/L)			**DET'N LIMIT = 0.2**	**GUIDELINE = 30-500 (A3)**
AUG	262.400	260.800	.	259.400
SEP	258.900	258.100	256.400	257.300
OCT	258.100	260.300	255.000	256.300
NOV	257.800	259.500	258.500	256.900
DEC	265.900	266.500	268.700	270.400
CALCIUM (MG/L)			**DET'N LIMIT = 0.2**	**GUIDELINE = 100 (F2)**
AUG	91.600	91.600	.	92.200
SEP	88.000	89.000	95.400	92.000
OCT	97.400	96.400	97.600	97.800
NOV	90.500	95.100	94.900	98.100
DEC	100.400	101.400	105.600	105.900
CHLORIDE (MG/L)			**DET'N LIMIT = 0.2**	**GUIDELINE = 250 (A3)**
AUG	29.600	29.300	.	29.400
SEP	24.400	24.900	38.000	28.700
OCT	29.900	30.400	39.200	38.000
NOV	31.300	31.500	35.800	46.100
DEC	32.000	32.800	44.500	39.900
COLOUR (HZU)			**DET'N LIMIT = 0.5**	**GUIDELINE = 5 (A3)**
AUG	1.500 <T	1.500 <T	.	1.000 <T
SEP	2.000 <T	2.000 <T	.500 <T	1.000 <T
OCT	1.000 <T	1.000 <T	1.000 <T	1.000 <T
NOV	2.500	1.500 <T	BDL	1.500 <T
DEC	2.500	1.500 <T	.500 <T	7.500
CONDUCTIVITY (UMHO/CM)			**DET'N LIMIT = 1.**	**GUIDELINE = 400 (F2)**
AUG	669	670	.	664
SEP	636	644	714	664
OCT	694	694	729	730
NOV	681	681	700	748
DEC	716	716	779	792
DISS ORG CARBON (MG/L)			**DET'N LIMIT = 0.100**	**GUIDELINE = 5.0 (A3)**
AUG	1.200	1.200	.	1.200
SEP	1.200	1.100	1.600	1.300
OCT	1.300	1.400	1.300	1.300
NOV	1.400	1.400	1.500	1.300
DEC	1.200	1.100	1.000	1.000
FLUORIDE (MG/L)			**DET'N LIMIT = 0.01**	**GUIDELINE = 2.4 (A1)**
AUG	.140	.140	.	.140
SEP	.140	.140	.240	.160
OCT	.160	.140	.200	.200
NOV	.140	.140	.160	.240
DEC	.160	.160	.220	.220

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
HARDNESS (MG/L)			DET'N LIMIT = 0.5	GUIDELINE = 80-100 (A4)
AUG	344.000	342.000	.	345.000
SEP	328.000	333.000	356.000	346.000
OCT	360.000	357.000	365.000	365.000
NOV	336.600	347.500	350.100	363.900
DEC	372.500	374.600	392.600	393.400
IONCAL (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
AUG	.501	.951	.	2.107
SEP	.917	.812	.748	.700
OCT	2.295	.679	1.551	.696
NOV	2.623	.578	.391	.639
DEC	.882	.771	1.493	2.187
LANGELIERS INDEX (DIMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = N/A
AUG	1.296	1.153	.	1.204
SEP	1.245	1.218	1.272	1.200
OCT	1.334	1.304	1.258	1.271
NOV	1.233	1.197	1.274	1.503
DEC	1.289	1.295	1.323	1.306
MAGNESIUM (MG/L)			DET'N LIMIT = 0.10	GUIDELINE = 30 (F2)
AUG	27.900	27.600	.	27.900
SEP	26.300	26.900	28.800	28.200
OCT	28.400	28.300	29.500	29.300
NOV	26.900	26.750	27.450	28.900
DEC	29.600	29.500	31.300	31.300
SODIUM (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 200 (A4)
AUG	13.400	13.400	.	13.400
SEP	11.000	10.800	17.200	12.200
OCT	14.400	14.200	18.200	17.800
NOV	13.200	13.400	15.500	20.900
DEC	14.300	14.000	21.100	21.200
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)
AUG	.014	.010	.	.010
SEP	BDL	BDL	BDL	BDL
OCT	BDL	BDL	.026	.022
NOV	BDL	.002 <T	BDL	.038
DEC	.002 <T	BDL	.010	.020
NITRITE (MG/L)			DET'N LIMIT = 0.001	GUIDELINE = 1 (A1)
AUG	.001 <T	.001 <T	.	.001 <T
SEP	.006	.005	.006	.008
OCT	BDL	BDL	.002 <T	.002 <T
NOV	BDL	BDL	BDL	.001 <T
DEC	.006	.004 <T	.004 <T	.006

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
TOTAL NITRATES (MG/L)			**DET'N LIMIT = 0.005**	**GUIDELINE = 10 (A1)**
AUG	2.370	2.390	.	2.390
SEP	2.420	2.320	1.780	2.150
OCT	1.640	1.630	1.320	1.420
NOV	1.920	1.890	1.680	1.460
DEC	2.150	2.130	1.910	1.940
NITROGEN TOT KJELD (MG/L)			**DET'N LIMIT = 0.02**	**GUIDELINE = N/A**
AUG	.140	.140	.	.180
SEP	.110	.100	.160	.110
OCT	.120	.110	.110	.130
NOV	.150	.180	.160	.160
DEC	.090 <T	.130	.090 <T	.100
PH (DMNSLESS)			**DET'N LIMIT = N/A**	**GUIDELINE = 6.5-8.5(A4)**
AUG	8.390	8.250	.	8.300
SEP	8.360	8.330	8.360	8.300
OCT	8.410	8.380	8.340	8.350
NOV	8.340	8.280	8.360	8.580
DEC	8.340	8.340	8.350	8.330
PHOSPHORUS FIL REACT (MG/L)			**DET'N LIMIT = 0.0005**	**GUIDELINE = N/A**
AUG	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	BDL	.001 <T	.	.
DEC	BDL	.000 <T	.	.
PHOSPHORUS TOTAL (MG/L)			**DET'N LIMIT = 0.002**	**GUIDELINE = .40 (F2)**
AUG	.002 <T	.002 <T	.	.
SEP	BDL	BDL	.	.
OCT	BDL	BDL	.	.
NOV	.004 <T	.004 <T	.	.
DEC	BDL	BDL	.	.
SULPHATE (MG/L)			**DET'N LIMIT = 0.20**	**GUIDELINE = 500 (A3)**
AUG	55.880	55.010	.	54.780
SEP	50.990	55.460	77.460	61.660
OCT	73.370	73.330	80.210	82.340
NOV	63.480	61.270	67.290	81.440
DEC	78.080	78.270	89.890	92.520
TURBIDITY (FTU)			**DET'N LIMIT = 0.05**	**GUIDELINE = 1 (A1)**
AUG	.390	.280	.	.230 <T
SEP	.150 <T	.160 <T	.390	.250
OCT	.370	.250	.180 <T	.210 <T
NOV	.110 <T	.220 <T	.190 <T	.200 <T
DEC	.270	.190	.580	.360

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
METALS				
SILVER (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A1)
AUG	BDL	BDL	.	BDL
SEP	BDL	BDL	.070 <T	BDL
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)
AUG	4.500	4.300	.	4.900
SEP	5.900	6.200	7.400	6.400
OCT	1.300	1.400	1.700	1.300
NOV	1.200	1.600	1.500	2.000
DEC	1.700	1.700	1.400	1.700
ARSENIC (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)
AUG	.320 <T	.220 <T	.	.220 <T
SEP	.150 <T	BDL	.530 <T	BDL
OCT	.400 <T	.400 <T	.550 <T	.360 <T
NOV	.380 <T	.390 <T	.550 <T	.640 <T
DEC	BDL	BDL	BDL	BDL
BARIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)
AUG	48.000	47.000	.	44.000
SEP	52.000	52.000	52.000	50.000
OCT	49.000	49.000	52.000	47.000
NOV	44.000	45.000	48.000	47.000
DEC	48.000	46.000	48.000	47.000
BORON (UG/L)			DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)
AUG	51.000	57.000	.	54.000
SEP	23.000	31.000	38.000	21.000
OCT	25.000	25.000	33.000	27.000
NOV	13.000 <T	21.000	25.000	33.000
DEC	18.000 <T	16.000 <T	22.000	23.000
BERYLLIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 6800 (D4)
AUG	BDL	BDL	.	.080 <T
SEP	BDL	BDL	BDL	BDL
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
CADMIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
AUG	.120 <T	.140 <T	.	.070 <T
SEP	.170 <T	.110 <T	.140 <T	.130 <T
OCT	.110 <T	.120 <T	.130 <T	.110 <T
NOV	.080 <T	.110 <T	.120 <T	.080 <T
DEC	.080 <T	.080 <T	.100 <T	.070 <T

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
COBALT (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = N/A
AUG	BDL	BDL	.	BDL
SEP	.320 <T	.200 <T	.340 <T	.370 <T
OCT	BDL	BDL	.050 <T	.050 <T
NOV	.130 <T	.110 <T	.150 <T	.170 <T
DEC	BDL	BDL	BDL	BDL
CHROMIUM (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)
AUG	4.300 <T	5.200	.	5.000 <T
SEP	1.800 <T	2.900 <T	2.600 <T	1.200 <T
OCT	6.600	6.200	7.300	4.000 <T
NOV	BDL	4.000 <T	5.000 <T	5.500
DEC	1.800 <T	1.200 <T	2.300 <T	2.400 <T
COPPER (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 1000 (A3)
AUG	1.500 <T	1.700 <T	.	56.000
SEP	3.500 <T	3.100 <T	940.000	140.000
OCT	2.000 <T	2.000 <T	1100.000	63.000
NOV	6.000	1.800 <T	630.000	66.000
DEC	2.300 <T	4.700 <T	100.000	98.000
IRON (UG/L)			DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)
AUG	BDL	BDL	.	BDL
SEP	7.400 <T	BDL	16.000 <T	8.000 <T
OCT	BDL	BDL	8.400 <T	9.600 <T
NOV	BDL	BDL	BDL	14.000 <T
DEC	BDL	BDL	6.700 <T	7.300 <T
MERCURY (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = 1 (A1)
AUG	BDL	BDL	.	.
SEP	BDL	BDL	.	.
OCT	BDL	.050 <T	.	.
NOV	BDL	BDL	.	.
DEC	BDL	.050 <T	.	.
MANGANESE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A3)
AUG	.140 <T	.170 <T	.	.250 <T
SEP	.220 <T	.230 <T	4.700	1.500
OCT	.140 <T	.110 <T	2.800	2.200
NOV	.070 <T	.090 <T	1.100	3.100
DEC	.220 <T	.220 <T	2.600	2.600
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A
AUG	.450 <T	.500 <T	.	.490 <T
SEP	.550	.600	.850	.730
OCT	.610	.590	.790	.740
NOV	.500 <T	.510	.630	.810
DEC	.530	.610	.930	.980

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
NICKEL (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 350 (D3)
AUG	BDL	BDL	.	BDL
SEP	BDL	BDL	.580 <T	.390 <T
OCT	3.600	3.500	3.400	2.800
NOV	1.600 <T	1.500 <T	2.300	1.900 <T
DEC	2.900	3.300	3.000	3.000
LEAD (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 10. (A1)
AUG	.230 <T	.340 <T	.	.650
SEP	.250 <T	.360 <T	2.400	.660
OCT	.210 <T	.260 <T	2.200	.480 <T
NOV	.300 <T	.280 <T	1.000	.390 <T
DEC	.220 <T	.300 <T	.380 <T	.430 <T
ANTIMONY (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 146 (D4)
AUG	.420 <T	.420 <T	.	.380 <T
SEP	.320 <T	.290 <T	.500 <T	.390 <T
OCT	.560	.370 <T	.550	.500 <T
NOV	.530	.540	.580	.540
DEC	.500 <T	.510	.500 <T	.570
SELENIUM (UG/L)			DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)
AUG	1.100 <T	BDL	.	BDL
SEP	BDL	BDL	1.100 <T	BDL
OCT	BDL	1.900 <T	2.000 <T	2.000 <T
NOV	BDL	BDL	1.200 <T	1.200 <T
DEC	BDL	1.600 <T	1.500 <T	1.300 <T
STRONTIUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = N/A
AUG	280.000	270.000	.	280.000
SEP	300.000	390.000	3000.000	1000.000
OCT	460.000	460.000	2100.000	2000.000
NOV	310.000	300.000	860.000	2500.000
DEC	530.000	510.000	2200.000	2200.000
TITANIUM (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = N/A
AUG	14.000	14.000	.	13.000
SEP	22.000	23.000	25.000	23.000
OCT	6.300	6.400	6.600	6.200
NOV	7.900	8.400	8.900	10.000
DEC	7.800	7.800	8.200	8.700
URANIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (A1)
AUG	.610	.680	.	.630
SEP	.680	.630	.710	.680
OCT	.680	.640	.650	.680
NOV	.650	.650	.690	.640
DEC	.690	.640	.650	.630

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
VANADIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A
AUG	.100 <T	.080 <T	.	.080 <T
SEP	.090 <T	.080 <T	.140 <T	.080 <T
OCT	.120 <T	.110 <T	.130 <T	.120 <T
NOV	BDL	BDL	.070 <T	.080 <T
DEC	BDL	BDL	BDL	BDL
ZINC (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)
AUG	100.000	100.000	.	98.000
SEP	120.000	120.000	130.000	120.000
OCT	130.000	130.000	120.000	110.000
NOV	110.000	110.000	110.000	100.000
DEC	140.000	140.000	120.000	120.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1		
			STANDING	FREE FLOW	
PHENOLICS (UG/L	PHENOLICS)		DET'N LIMIT = .200	GUIDELINE = 2	(A4)
AUG	BDL	BDL	.	.	
SEP	BDL	BDL	.	.	
OCT	BDL	.400 <T	.	.	
NOV	.800 <T	.600 <T	.	.	
DEC	.600 <T	BDL	.	.	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM GUELPH - F.M. WOODS PUMPING STATION (1990)

	WELL HEAD	RESERVOIR	DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
VOLATILES				
ETHYLBENZENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 2.4 (A3)
AUG	BDL	BDL	.	BDL
SEP	BDL	BDL	.	BDL
OCT	BDL	BDL	.	BDL
NOV	.050 <T	BDL	.	.050 <T
DEC	BDL	BDL	.	BDL
STYRENE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (D1)
AUG	BDL	BDL	.	BDL
SEP	BDL	.050 <T	.	BDL
OCT	BDL	BDL	.	BDL
NOV	.150 <T	.050 <T	.	.150 <T
DEC	.100 <T	BDL	.	.100 <T
CHLOROFORM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
AUG	BDL	.400 <T	.	.300 <T
SEP	BDL	.200 <T	.	.200 <T
OCT	BDL	.900 <T	.	.900 <T
NOV	BDL	1.200	.	.900 <T
DEC	BDL	.200 <T	.	.200 <T
DICHLOROBROMOMETHANE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)
AUG	BDL	.500 <T	.	.350 <T
SEP	BDL	.150 <T	.	.100 <T
OCT	BDL	3.100	.	2.900
NOV	BDL	3.250	.	2.350
DEC	BDL	1.000	.	.900
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)
AUG	BDL	.500 <T	.	.600 <T
SEP	BDL	BDL	.	BDL
OCT	BDL	6.500	.	5.900
NOV	BDL	5.900	.	4.200
DEC	BDL	3.700	.	2.900
BROMOFORM (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)
AUG	BDL	.200 <T	.	.200 <T
SEP	BDL	BDL	.	BDL
OCT	BDL	3.200	.	2.800
NOV	BDL	3.800	.	2.600
DEC	BDL	8.200	.	5.200
TOTAL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)
AUG	BDL	1.650 <T	.	1.450 <T
SEP	BDL	BDL	.	BDL
OCT	BDL	13.600	.	12.500
NOV	BDL	14.100	.	10.200
DEC	BDL	13.000	.	9.200

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL	DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 0 (A1)
SEP	0	.	.	.
NOV	0	.	.	.
DEC	0	.	.	.
STANDRD PLATE CNT MF (COUNT/ML)		DET'N LIMIT = 0		GUIDELINE = 500/ML (A3)
AUG	.	1 <=>	.	1 <=>
SEP	.	6 <=>	.	ILA
OCT	.	6 <=>	.	1 <=>
NOV	.	0 <=>	.	1 <=>
DEC	.	0 <=>	.	0 <=>
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 5/100ML(A1)
SEP	4	.	.	.
NOV	0	.	.	.
DEC	0	.	.	.
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = N/A
SEP	8	.	.	.
NOV	0	.	.	.
DEC	1	.	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.	.000	.000
SEP	.	.	.000	.000
OCT	.	.	.000	.000
NOV	.	.000	.100	.100
DEC	.	.100	.000	.000
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.	.000	.000
SEP	.	.	.000	.000
OCT	.	.100	.100	.100
NOV	.	.100	.100	.100
DEC	.	.100	.100	.100
FLD CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.	.000	.000
SEP	.	.	.000	.000
OCT	.	.100	.100	.100
NOV	.	.100	.200	.200
DEC	.	.200	.100	.100
FLD PH (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
AUG	.	7.500	7.600	7.500
SEP	7.400	7.600	7.600	7.600
OCT	.	7.400	7.600	7.600
NOV	7.400	7.600	7.600	7.600
DEC	7.200	7.400	7.600	7.600
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A	GUIDELINE = 15 (A3)
AUG	.	13.000	20.000	16.000
SEP	9.000	12.000	19.000	16.500
OCT	.	11.000	18.000	15.000
NOV	9.000	10.000	20.000	14.000
DEC	9.000	9.000	17.000	11.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
CHEMISTRY (LAB)				
ALKALINITY (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 30-500 (A3)
AUG	.	275.900	295.600	276.200
SEP	289.300	272.400	282.700	273.100
OCT	.	262.500	285.100	262.500
NOV	272.800	271.100	272.000	270.700
DEC	296.800	275.300	274.800	276.600
CALCIUM (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 100 (F2)
AUG	.	101.000	97.000	101.000
SEP	100.000	99.200	99.400	99.400
OCT	.	97.200	98.800	101.000
NOV	87.200	96.600	97.200	98.000
DEC	104.100	103.600	103.700	102.800
CHLORIDE (MG/L)		DET'N LIMIT = 0.2		GUIDELINE = 250 (A3)
AUG	.	47.300	50.100	45.000
SEP	32.200	46.200	43.100	47.200
OCT	.	38.400	48.000	49.000
NOV	32.600	39.500	39.300	39.100
DEC	32.000	33.900	34.200	34.300
COLOUR (HZU)		DET'N LIMIT = 0.5		GUIDELINE = 5 (A3)
AUG	.	1.000 <T	.500 <T	1.000 <T
SEP	4.500	1.500 <T	BDL	1.000 <T
OCT	.	1.000 <T	1.000 <T	.500 <T
NOV	3.500	1.500 <T	1.000 <T	1.500 <T
DEC	4.000	1.000 <T	1.000 <T	1.000 <T
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1.		GUIDELINE = 400 (F2)
AUG	.	776	765	772
SEP	724	763	775	766
OCT	.	734	780	738
NOV	742	737	734	733
DEC	734	726	726	731
DISS ORG CARBON (MG/L)		DET'N LIMIT = .100		GUIDELINE = 5.0 (A3)
AUG	.	1.200	1.100	1.000
SEP	.900	1.000	1.000	1.000
OCT	.	1.400	1.400	1.200
NOV	1.000	1.300	1.300	1.400
DEC	1.000	.800	.900	.900
FLUORIDE (MG/L)		DET'N LIMIT = 0.01		GUIDELINE = 2.4 (A1)
AUG	.	.180	.120	.180
SEP	.080	.180	.160	.180
OCT	.	.160	.160	.200
NOV	.100	.180	.180	.180
DEC	.100	.200	.200	.200

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
HARDNESS (MG/L)			**DET'N LIMIT = 0.5**	**GUIDELINE = 80-100 (A4)**
AUG	.	372.000	371.000	375.000
SEP	377.000	370.000	381.000	367.000
OCT	.	359.000	380.000	376.000
NOV	339.500	355.900	360.600	364.300
DEC	392.200	384.800	384.400	385.300
IONCAL (DIMNSLESS)			**DET'N LIMIT = N/A**	**GUIDELINE = N/A**
AUG	.	.405	1.024	.754
SEP	.851	.368	.292	1.530
OCT	.	1.146	.120	1.818
NOV	4.048	1.987	1.712	.073
DEC	3.790	2.515	2.192	2.211
LANGELIERS INDEX (DIMNSLESS)			**DET'N LIMIT = N/A**	**GUIDELINE = N/A**
AUG	.	1.265	1.298	1.266
SEP	1.234	1.272	1.379	1.324
OCT	.	1.319	1.420	1.355
NOV	1.158	1.230	1.344	1.266
DEC	1.322	1.358	1.377	1.336
MAGNESIUM (MG/L)			**DET'N LIMIT = 0.10**	**GUIDELINE = 30 (F2)**
AUG	.	29.400	31.300	29.900
SEP	30.800	29.700	32.300	28.900
OCT	.	28.400	32.300	30.100
NOV	29.600	27.900	28.650	29.100
DEC	32.100	30.650	30.500	31.250
SODIUM (MG/L)			**DET'N LIMIT = 0.2**	**GUIDELINE = 200 (A4)**
AUG	.	23.800	25.400	23.200
SEP	16.000	23.600	23.800	23.800
OCT	.	18.800	24.800	25.400
NOV	16.100	18.500	17.600	17.600
DEC	17.100	15.900	16.000	16.000
AMMONIUM TOTAL (MG/L)			**DET'N LIMIT = 0.002**	**GUIDELINE = 0.05 (F2)**
AUG	.	.010	.060	.016
SEP	BDL	BDL	BDL	BDL
OCT	.	BDL	.046	.006 <T
NOV	.016	BDL	BDL	BDL
DEC	.024	.002 <T	.008 <T	.002 <T
NITRITE (MG/L)			**DET'N LIMIT = 0.001**	**GUIDELINE = 1 (A1)**
AUG	.	.001 <T	.008	.001 <T
SEP	.010	.003 <T	.008	.004 <T
OCT	.	BDL	.005	.002 <T
NOV	.002 <T	.001 <T	BDL	BDL
DEC	.007	.005	.005	.004 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
TOTAL NITRATES (MG/L)		DET'N LIMIT = 0.005		GUIDELINE = 10 (A1)
AUG	.	1.890	.350	1.820
SEP	.805	1.800	.815	1.780
OCT	.	1.540	.605	1.420
NOV	.760	1.570	1.570	1.570
DEC	.810	1.720	1.790	1.710
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02		GUIDELINE = N/A
AUG	.	.130	.200	.140
SEP	.060 <T	.090 <T	.090 <T	.100
OCT	.	.120	.140	.110
NOV	.110	.120	.110	.140
DEC	.090 <T	.070 <T	.090 <T	.070 <T
PH (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)
AUG	.	8.300	8.320	8.300
SEP	8.250	8.320	8.410	8.370
OCT	.	8.390	8.450	8.410
NOV	8.260	8.290	8.400	8.320
DEC	8.310	8.380	8.400	8.360
PHOSPHORUS FIL REACT (MG/L)		DET'N LIMIT = 0.0005		GUIDELINE = N/A
AUG	.	BDL	.	.
SEP	BDL	BDL	.	.
OCT	.	.000 <T	.	.
NOV	.000 <T	BDL	.	.
DEC	.000 <T	.001 <T	.	.
PHOSPHORUS TOTAL (MG/L)		DET'N LIMIT = 0.002		GUIDELINE = .40 (F2)
AUG	.	.002 <T	.	.
SEP	BDL	BDL	.	.
OCT	.	BDL	.	.
NOV	.005 <T	.005 <T	.	.
DEC	BDL	BDL	.	.
SULPHATE (MG/L)		DET'N LIMIT = .200		GUIDELINE = 500 (A3)
AUG	.	74.220	52.430	73.320
SEP	67.370	75.630	81.770	76.060
OCT	.	79.530	75.060	83.410
NOV	65.550	68.820	69.720	68.680
DEC	66.040	76.620	77.570	76.690
TURBIDITY (FTU)		DET'N LIMIT = 0.05		GUIDELINE = 1 (A1)
AUG	.	.300	.670	.970
SEP	.790	.270	.340	.310
OCT	.	.240 <T	.230 <T	.430
NOV	1.200	.290	.210 <T	.350
DEC	1.360	.250	1.100	.540

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
METALS				
SILVER (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A1)
AUG	.	BDL	BDL	BDL
SEP	BDL	BDL	4.100	BDL
OCT	.	BDL	.890	BDL
NOV	BDL	BDL	.060 <T	BDL
DEC	BDL	BDL	2.200	BDL
ALUMINUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)
AUG	.	5.100	7.500	6.400
SEP	7.800	7.300	8.100	7.000
OCT	.	1.800	2.100	1.600
NOV	1.300	1.900	2.900	3.000
DEC	1.500	2.000	3.400	2.000
ARSENIC (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)
AUG	.	.610 <T	.580 <T	.500 <T
SEP	1.100	.240 <T	.710 <T	.570 <T
OCT	.	.350 <T	.430 <T	.500 <T
NOV	1.800	.810 <T	.900 <T	.880 <T
DEC	1.000 <T	BDL	BDL	BDL
BARIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)
AUG	.	46.000	41.000	45.000
SEP	46.000	50.000	46.000	49.000
OCT	.	46.000	45.000	49.000
NOV	46.000	47.000	49.000	49.000
DEC	45.000	44.000	48.000	45.000
BORON (UG/L)			DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)
AUG	.	58.000	170.000	54.000
SEP	29.000	25.000	120.000	32.000
OCT	.	29.000	120.000	22.000
NOV	30.000	27.000	17.000 <T	23.000
DEC	18.000 <T	17.000 <T	18.000 <T	17.000 <T
BERYLLIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 6800 (D4)
AUG	.	BDL	.080 <T	BDL
SEP	.070 <T	BDL	.080 <T	BDL
OCT	.	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
CADMIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)
AUG	.	.080 <T	.260 <T	.090 <T
SEP	BDL	.110 <T	.110 <T	.070 <T
OCT	.	.090 <T	.080 <T	.080 <T
NOV	.060 <T	.090 <T	.100 <T	.110 <T
DEC	BDL	BDL	.100 <T	.060 <T

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
COBALT (UG/L)			**DET'N LIMIT = 0.02**	**GUIDELINE = N/A**
AUG	.	.550 <T	.170 <T	.610 <T
SEP	.540 <T	1.500	.960 <T	1.400
OCT	.	.350 <T	.400 <T	.820 <T
NOV	.300 <T	.490 <T	.490 <T	.490 <T
DEC	BDL	BDL	BDL	BDL
CHROMIUM (UG/L)			**DET'N LIMIT = 0.50**	**GUIDELINE = 50 (A1)**
AUG	.	5.200	2.000 <T	4.600 <T
SEP	2.000 <T	1.200 <T	3.000 <T	2.000 <T
OCT	.	6.900	5.000 <T	BDL
NOV	6.000	4.900 <T	BDL	3.100 <T
DEC	.970 <T	2.100 <T	1.900 <T	1.800 <T
COPPER (UG/L)			**DET'N LIMIT = 0.50**	**GUIDELINE = 1000 (A3)**
AUG	.	1.200 <T	350.000	59.000
SEP	.990 <T	1.800 <T	770.000	40.000
OCT	.	1.300 <T	230.000	29.000
NOV	.880 <T	1.400 <T	420.000	46.000
DEC	.850 <T	.990 <T	430.000	31.000
IRON (UG/L)			**DET'N LIMIT = 6.00**	**GUIDELINE = 300 (A3)**
AUG	.	27.000 <T	42.000 <T	21.000 <T
SEP	140.000	25.000 <T	18.000 <T	22.000 <T
OCT	.	BDL	24.000 <T	17.000 <T
NOV	150.000	28.000 <T	22.000 <T	29.000 <T
DEC	180.000	37.000 <T	25.000 <T	39.000 <T
MERCURY (UG/L)			**DET'N LIMIT = 0.02**	**GUIDELINE = 1 (A1)**
AUG	.	BDL	.	.
SEP	BDL	BDL	.	.
OCT	.	BDL	.	.
NOV	BDL	BDL	.	.
DEC	BDL	.060 <T	.	.
MANGANESE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 50 (A3)**
AUG	.	4.200	3.100	4.000
SEP	3.600	4.700	3.600	4.600
OCT	.	1.700	3.000	3.800
NOV	3.500	2.300	2.600	2.300
DEC	3.800	1.400	1.800	1.300
MOLYBDENUM (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = N/A**
AUG	.	.960	.560	.940
SEP	1.200	1.100	.870	1.100
OCT	.	.790	.790	1.000
NOV	1.200	.860	.940	.870
DEC	1.100	.730	.860	.840

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL	DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
NICKEL (UG/L)			**DET'N LIMIT = 0.20**	**GUIDELINE = 350 (D3)**
AUG	.	BDL	BDL	BDL
SEP	.860 <T	2.000 <T	22.000	3.200
OCT	.	4.100	2.100	2.100
NOV	2.400	2.900	3.900	3.000
DEC	2.700	2.300	4.200	3.100
LEAD (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 10. (A1)**
AUG	.	.330 <T	25.000	1.300
SEP	.330 <T	.340 <T	6.900	.920
OCT	.	.250 <T	2.000	.750
NOV	.260 <T	.260 <T	4.400	1.100
DEC	.300 <T	.200 <T	4.200	.730
ANTIMONY (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 146 (D4)**
AUG	.	.400 <T	.400 <T	.480 <T
SEP	.390 <T	.350 <T	.620	.530
OCT	.	.500 <T	.600	.700
NOV	.500 <T	.560	.620	.550
DEC	.550	.450 <T	.690	.520
SELENIUM (UG/L)			**DET'N LIMIT = 1.00**	**GUIDELINE = 10 (A1)**
AUG	.	BDL	BDL	BDL
SEP	BDL	BDL	1.200 <T	1.100 <T
OCT	.	2.400 <T	1.300 <T	2.500 <T
NOV	1.400 <T	1.100 <T	1.400 <T	1.100 <T
DEC	BDL	1.400 <T	1.800 <T	1.800 <T
STRONTIUM (UG/L)			**DET'N LIMIT = 0.10**	**GUIDELINE = N/A**
AUG	.	900.000	500.000	880.000
SEP	400.000	1100.000	1200.000	1100.000
OCT	.	780.000	950.000	1200.000
NOV	410.000	700.000	720.000	730.000
DEC	430.000	860.000	860.000	870.000
TITANIUM (UG/L)			**DET'N LIMIT = 0.50**	**GUIDELINE = N/A**
AUG	.	16.000	16.000	16.000
SEP	30.000	27.000	28.000	27.000
OCT	.	7.000	8.300	8.000
NOV	12.000	10.000	10.000	11.000
DEC	10.000	9.300	8.900	9.300
URANIUM (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 100 (A1)**
AUG	.	.940	.490 <T	.890
SEP	.780	1.100	.970	1.200
OCT	.	.800	.740	1.100
NOV	.920	.950	.890	.890
DEC	.780	.690	.790	.810

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL	DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
VANADIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A
AUG	.	.070 <T	.070 <T	.090 <T
SEP	.090 <T	.140 <T	.140 <T	.070 <T
OCT	.	.110 <T	.110 <T	.120 <T
NOV	.080 <T	.070 <T	.060 <T	.070 <T
DEC	BDL	BDL	BDL	BDL
ZINC (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)
AUG	.	86.000	84.000	88.000
SEP	37.000	100.000	160.000	93.000
OCT	.	110.000	62.000	100.000
NOV	40.000	100.000	140.000	100.000
DEC	34.000	95.000	130.000	100.000

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL	DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
PESTICIDES & PCB				
ATRAZINE (NG/L)			DET'N LIMIT = 50	GUIDELINE = 60000 (A2)
AUG	.	BDL	.	.
SEP	150.000 <T	BDL	.	.
OCT	.	BDL	.	.
NOV	350.000 <T	BDL	.	.
DEC	480.000 <T	110.000 <T	.	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1		
			STANDING	FREE FLOW	
PHENOLICS (UG/L)			DET'N LIMIT = .200		GUIDELINE = 2 (A4)
AUG	.	BDL	.	.	
SEP	BDL	BDL	.	.	
OCT	.	.600 <T	.	.	
NOV	BDL	BDL	.	.	
DEC	1.000	1.000 <T	.	.	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL	DISTRIBUTION SYSTEM		
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
VOLATILES				
ETHYLBENZENE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 2.4 (A3)**
AUG	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL
OCT	.	BDL	.	BDL
NOV	.050 <T	.050 <T	.	.050 <T
DEC	.050 <T	.050 <T	.	BDL
STYRENE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 100 (D1)**
AUG	.	BDL	.	BDL
SEP	BDL	BDL	.	BDL
OCT	.	BDL	.	.050 <T
NOV	.150 <T	.100 <T	.	.150 <T
DEC	.100 <T	BDL	.	BDL
CHLOROFORM (UG/L)			**DET'N LIMIT = 0.10**	**GUIDELINE = 350 (A1+)**
AUG	.	.600 <T	.	.800 <T
SEP	BDL	.200 <T	.	.200 <T
OCT	.	1.200	.	1.100
NOV	BDL	3.000	.	3.100
DEC	BDL	1.500	.	1.300
111, TRICHLOROETHANE (UG/L)			**DET'N LIMIT = 0.02**	**GUIDELINE = 200 (D1)**
AUG	.	.100 <T	.	.080 <T
SEP	BDL	.080 <T	.	.100 <T
OCT	.	.040 <T	.	.060 <T
NOV	BDL	.060 <T	.	.060 <T
DEC	BDL	BDL	.	BDL
TRICHLOROETHYLENE (UG/L)			**DET'N LIMIT = 0.10**	**GUIDELINE = 50 (A1)**
AUG	.	BDL	.	BDL
SEP	BDL	BDL	.	.100 <T
OCT	.	BDL	.	.100 <T
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
DICHLOROBROMOMETHANE (UG/L)			**DET'N LIMIT = 0.05**	**GUIDELINE = 350 (A1+)**
AUG	.	1.450	.	1.600
SEP	BDL	.400 <T	.	.400 <T
OCT	.	4.000	.	3.600
NOV	BDL	5.350	.	5.200
DEC	BDL	4.000	.	3.600
CHLORODIBROMOMETHANE (UG/L)			**DET'N LIMIT = 0.10**	**GUIDELINE = 350 (A1+)**
AUG	.	3.000	.	3.400
SEP	BDL	.700 <T	.	.800 <T
OCT	.	8.900	.	8.100
NOV	BDL	7.900	.	7.700
DEC	BDL	7.900	.	7.400

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH PAISLEY ROAD WELL 1990

	PAISLEY ROAD WELL		DISTRIBUTION SYSTEM	
	RAW	TREATED	SITE 1	
			STANDING	FREE FLOW
T-CHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 5 (D1)
AUG	.	.150 <T	.	.150 <T
SEP	BDL	.100 <T	.	.150 <T
OCT	.	.050 <T	.	.100 <T
NOV	BDL	BDL	.	BDL
DEC	BDL	BDL	.	BDL
BROMOFORM (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (A1+)
AUG	.	2.200	.	2.600
SEP	BDL	.800 <T	.	.800 <T
OCT	.	4.800	.	6.600
NOV	BDL	4.400	.	4.400
DEC	BDL	8.000	.	8.200
TOTAL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50		GUIDELINE = 350 (A1)
AUG	.	7.300	.	8.300
SEP	BDL	2.100 <T	.	2.200 <T
OCT	.	19.000	.	19.400
NOV	BDL	20.650	.	20.300
DEC	BDL	21.400	.	20.600

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED		
BACTERIOLOGICAL				
FECAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = 0 (A1)
AUG	BDL	.		
SEP	0	.		
OCT	0	.		
NOV	0	.		
DEC	!SF	.		
STANDRD PLATE CNT MF (COUNT/ML)			DET'N LIMIT = 0	GUIDELINE = 500/ML (A3)
AUG	.	2 <=>		
SEP	.	42		
OCT	.	0 <=>		
NOV	.	1 <=>		
DEC	.	0 <=>		
TOTAL COLIFORM MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = 5/100ML(A1)
AUG	BDL	.		
SEP	BDL	.		
OCT	0	.		
NOV	2	.		
DEC	!SF	.		
T COLIFORM BCKGRD MF (CT/100ML)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	BDL	.		
SEP	BDL	.		
OCT	0	.		
NOV	1	.		
DEC	!SF	.		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED		
CHEMISTRY (FLD)				
FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.100		
NOV	.	.000		
DEC	.	.100		
FLD CHLORINE FREE (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.300		
SEP	.	.100		
OCT	.	.100		
NOV	.	.100		
DEC	.	.100		
FLD CHLORINE (TOTAL) (MG/L)			DET'N LIMIT = 0	GUIDELINE = N/A
AUG	.	.400		
SEP	.	.100		
OCT	.	.100		
NOV	.	.100		
DEC	.	.200		
FLD PH (DMNSLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
AUG	7.200	7.500		
SEP	7.400	7.400		
OCT	7.200	7.400		
NOV	7.400	7.400		
DEC	7.600	7.600		
FLD TEMPERATURE (DEG.C)			DET'N LIMIT = N/A	GUIDELINE = 15 (A3)
AUG	9.000	11.000		
SEP	9.000	10.000		
OCT	10.000	10.000		
NOV	9.000	9.000		
DEC	9.000	9.000		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

CHEMISTRY (LAB)

	RAW	TREATED		
ALKALINITY (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A3)
AUG	276.400	273.700		
SEP	282.700	271.400		
OCT	276.500	277.200		
NOV	250.800	275.900		
DEC	279.700	280.400		
CALCIUM (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 100 (F2)
AUG	92.400	92.800		
SEP	94.200	99.200		
OCT	103.000	102.000		
NOV	96.400	106.600		
DEC	112.500	111.500		
CHLORIDE (MG/L)			DET'N LIMIT = 0.2	GUIDELINE = 250 (A3)
AUG	75.300	71.500		
SEP	77.700	73.800		
OCT	74.000	76.700		
NOV	76.800	76.600		
DEC	78.600	78.600		
COLOUR (HZU)			DET'N LIMIT = 0.5	GUIDELINE = 5 (A3)
AUG	.500 <T	.500 <T		
SEP	.500 <T	1.000 <T		
OCT	.500 <T	.500 <T		
NOV	.500 <T	1.000 <T		
DEC	1.000 <T	1.000 <T		
CONDUCTIVITY (UMHO/CM)			DET'N LIMIT = 1.	GUIDELINE = 400 (F2)
AUG	849	840		
SEP	836	845		
OCT	870	870		
NOV	916	915		
DEC	917	953		
DISS ORG CARBON (MG/L)			DET'N LIMIT = .100	GUIDELINE = 5.0 (A3)
AUG	.600	.600		
SEP	.600	.700		
OCT	.900	.800		
NOV	.700	.600		
DEC	.700	.700		
FLUORIDE (MG/L)			DET'N LIMIT = 0.01	GUIDELINE = 2.4 (A1)
AUG	.640	.620		
SEP	.580	.640		
OCT	.640	.640		
NOV	.680	.680		
DEC	.680	.700		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED	
HARDNESS (MG/L)			DET'N LIMIT = 0.5 GUIDELINE = 80-100 (A4)
AUG	382.000	381.000	
SEP	384.000	393.000	
OCT	406.000	398.000	
NOV	389.100	411.000	
DEC	436.200	434.900	
IONCAL (DMNSLESS)			DET'N LIMIT = N/A GUIDELINE = N/A
AUG	3.268	3.553	
SEP	.907	.671	
OCT	1.478	1.290	
NOV	1.489	1.589	
DEC	2.391	1.811	
LANGELIERS INDEX (DMNSLESS)			DET'N LIMIT = N/A GUIDELINE = N/A
AUG	1.284	1.292	
SEP	1.233	1.247	
OCT	1.300	1.297	
NOV	1.187	1.152	
DEC	1.301	1.337	
MAGNESIUM (MG/L)			DET'N LIMIT = 0.10 GUIDELINE = 30 (F2)
AUG	36.800	36.300	
SEP	36.000	35.300	
OCT	36.300	35.100	
NOV	36.100	35.200	
DEC	37.750	38.000	
SODIUM (MG/L)			DET'N LIMIT = 0.2 GUIDELINE = 200 (A4)
AUG	29.600	28.600	
SEP	29.000	29.200	
OCT	30.600	30.400	
NOV	33.000	32.600	
DEC	34.500	34.700	
AMMONIUM TOTAL (MG/L)			DET'N LIMIT = 0.002 GUIDELINE = 0.05 (F2)
AUG	.020	.010	
SEP	BDL	BDL	
OCT	.024	.006 <T	
NOV	.050	.046	
DEC	.046	.040	
NITRITE (MG/L)			DET'N LIMIT = 0.001 GUIDELINE = 1 (A1)
AUG	.002 <T	BDL	
SEP	.005	.003 <T	
OCT	.001 <T	.001 <T	
NOV	.002 <T	BDL	
DEC	.007	.006	

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED
TOTAL NITRATES (MG/L)	DET'N LIMIT = 0.005	GUIDELINE = 10 (A1)
AUG	.540	.705
SEP	1.200	.425
OCT	.365	.465
NOV	.280	.285
DEC	.275	.300
NITROGEN TOT KJELD (MG/L)	DET'N LIMIT = 0.02	GUIDELINE = N/A
AUG	.110	.080 <T
SEP	.040 <T	.030 <T
OCT	.090 <T	.060 <T
NOV	.160	.260
DEC	.110	.080 <T
PH (DMNSLESS)	DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5(A4)
AUG	8.360	8.370
SEP	8.290	8.300
OCT	8.330	8.330
NOV	8.290	8.170
DEC	8.290	8.330
PHOSPHORUS FIL REACT (MG/L)	DET'N LIMIT = 0.0005	GUIDELINE = N/A
AUG	BDL	.001 <T
SEP	BDL	BDL
OCT	.001 <T	.002 <T
NOV	.000 <T	.001 <T
DEC	.000 <T	.001 <T
PHOSPHORUS TOTAL (MG/L)	DET'N LIMIT = 0.002	GUIDELINE = .40 (F2)
AUG	.004 <T	.002 <T
SEP	BDL	.002 <T
OCT	BDL	BDL
NOV	.008 <T	.007 <T
DEC	BDL	.003 <T
SULPHATE (MG/L)	DET'N LIMIT = .200	GUIDELINE = 500 (A3)
AUG	73.570	78.710
SEP	51.730	79.200
OCT	80.740	80.830
NOV	103.620	100.610
DEC	103.630	104.600
TURBIDITY (FTU)	DET'N LIMIT = 0.05	GUIDELINE = 1 (A1)
AUG	.260	.310
SEP	.220 <T	.210 <T
OCT	.230 <T	.340
NOV	.370	.230 <T
DEC	.720	.460

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED	
METALS			
SILVER (UG/L)			DET'N LIMIT = 0.05 GUIDELINE = 50 (A1)
AUG	BDL	BDL	
SEP	BDL	.080 <T	
OCT	BDL	BDL	
NOV	BDL	BDL	
DEC	BDL	BDL	
ALUMINUM (UG/L)			DET'N LIMIT = 0.10 GUIDELINE = 100 (A4)
AUG	6.200	5.600	
SEP	9.400	8.300	
OCT	1.100	1.500	
NOV	1.100	1.200	
DEC	1.400	1.500	
ARSENIC (UG/L)			DET'N LIMIT = 0.10 GUIDELINE = 25 (A1)
AUG	.510 <T	.450 <T	
SEP	.440 <T	.600 <T	
OCT	.730 <T	.790 <T	
NOV	1.300	1.300	
DEC	BDL	BDL	
BARIUM (UG/L)			DET'N LIMIT = 0.05 GUIDELINE = 1000 (A2)
AUG	50.000	47.000	
SEP	53.000	50.000	
OCT	49.000	49.000	
NOV	48.000	47.000	
DEC	50.000	48.000	
BORON (UG/L)			DET'N LIMIT = 2.00 GUIDELINE = 5000 (A1)
AUG	20.000 <T	48.000	
SEP	24.000	38.000	
OCT	25.000	30.000	
NOV	33.000	34.000	
DEC	25.000	24.000	
BERYLLIUM (UG/L)			DET'N LIMIT = 0.05 GUIDELINE = 6800 (D4)
AUG	BDL	BDL	
SEP	BDL	.070 <T	
OCT	BDL	BDL	
NOV	BDL	BDL	
DEC	BDL	BDL	
CADMIUM (UG/L)			DET'N LIMIT = 0.05 GUIDELINE = 5 (A1)
AUG	.130 <T	.150 <T	
SEP	.270 <T	.180 <T	
OCT	.090 <T	.140 <T	
NOV	.080 <T	.090 <T	
DEC	BDL	.060 <T	

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DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED		
COBALT (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = N/A
AUG	BDL	.230 <T		
SEP	.360 <T	.540 <T		
OCT	.160 <T	.160 <T		
NOV	.240 <T	.250 <T		
DEC	BDL	BDL		
CHROMIUM (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 50 (A1)
AUG	.600 <T	4.000 <T		
SEP	2.400 <T	3.300 <T		
OCT	4.500 <T	7.300		
NOV	5.400	5.700		
DEC	2.600 <T	2.000 <T		
COPPER (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = 1000 (A3)
AUG	1.300 <T	1.400 <T		
SEP	3.400 <T	2.000 <T		
OCT	1.200 <T	1.000 <T		
NOV	.870 <T	.840 <T		
DEC	.900 <T	.690 <T		
IRON (UG/L)			DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)
AUG	13.000 <T	19.000 <T		
SEP	6.600 <T	6.400 <T		
OCT	BDL	BDL		
NOV	25.000 <T	18.000 <T		
DEC	25.000 <T	21.000 <T		
MERCURY (UG/L)			DET'N LIMIT = 0.02	GUIDELINE = 1 (A1)
AUG	BDL	BDL		
SEP	BDL	BDL		
OCT	.110	.040 <T		
NOV	BDL	BDL		
DEC	BDL	ICS		
MANGANESE (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 50 (A3)
AUG	2.800	4.500		
SEP	1.100	3.300		
OCT	2.800	2.700		
NOV	4.000	4.000		
DEC	4.400	4.100		
MOLYBDENUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A
AUG	1.300	1.300		
SEP	1.400	1.400		
OCT	1.400	1.500		
NOV	1.300	1.500		
DEC	1.400	1.400		

TABLE 5
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UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED		
NICKEL (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 350 (D3)
AUG	BDL	BDL		
SEP	1.000 <T	.960 <T		
OCT	3.300	3.300		
NOV	1.900 <T	2.000 <T		
DEC	3.200	2.600		
LEAD (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 10. (A1)
AUG	4.700	4.800		
SEP	8.500	4.000		
OCT	3.800	4.200		
NOV	2.300	2.300		
DEC	2.000	2.100		
ANTIMONY (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 146 (D4)
AUG	.650	.510		
SEP	.350 <T	.470 <T		
OCT	.480 <T	.450 <T		
NOV	.420 <T	.440 <T		
DEC	.540	.530		
SELENIUM (UG/L)			DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)
AUG	1.600 <T	1.300 <T		
SEP	BDL	1.600 <T		
OCT	BDL	1.700 <T		
NOV	BDL	BDL		
DEC	BDL	BDL		
STRONTIUM (UG/L)			DET'N LIMIT = 0.10	GUIDELINE = N/A
AUG	1700.000	1700.000		
SEP	320.000	2000.000		
OCT	2100.000	2000.000		
NOV	3200.000	3000.000		
DEC	3500.000	3400.000		
TITANIUM (UG/L)			DET'N LIMIT = 0.50	GUIDELINE = N/A
AUG	19.000	19.000		
SEP	30.000	32.000		
OCT	7.400	7.700		
NOV	12.000	12.000		
DEC	10.000	10.000		
URANIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = 100 (A1)
AUG	1.300	1.300		
SEP	2.000	1.200		
OCT	1.300	1.400		
NOV	.930	.960		
DEC	.790	.860		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED		
VANADIUM (UG/L)			DET'N LIMIT = 0.05	GUIDELINE = N/A
AUG	.070 <T	.090 <T		
SEP	.170 <T	.150 <T		
OCT	.210 <T	.230 <T		
NOV	.090 <T	.080 <T		
DEC	BDL	BDL		
ZINC (UG/L)			DET'N LIMIT = 0.20	GUIDELINE = 5000 (A3)
AUG	170.000	140.000		
SEP	220.000	120.000		
OCT	110.000	120.000		
NOV	75.000	78.000		
DEC	74.000	73.000		

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED
PHENOLICS (UG/L)		
AUG	.400 <T	BDL
SEP	BDL	BDL
OCT	.400 <T	BDL
NOV	BDL	BDL
DEC	.600 <T	BDL

DET'N LIMIT = .200 GUIDELINE = 2 (A4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM GUELPH U OF GUELPH PUMPING STATION 1990

UNIVERSITY OF GUELPH PUMPING STATION

	RAW	TREATED	
VOLATILES			
ETHYLBENZENE (UG/L)			DET'N LIMIT = 0.05 GUIDELINE = 2.4 (A3)
AUG	BDL	IEF	
SEP	BDL	BDL	
OCT	BDL	BDL	
NOV	.050 <T	BDL	
DEC	.	IU	
STYRENE (UG/L)			DET'N LIMIT = 0.05 GUIDELINE = 100 (D1)
AUG	BDL	IEF	
SEP	BDL	BDL	
OCT	BDL	BDL	
NOV	.100 <T	.050 <T	
DEC	.	IU	
CHLOROFORM (UG/L)			DET'N LIMIT = 0.10 GUIDELINE = 350 (A1+)
AUG	.300 <T	IEF	
SEP	.300 <T	.200 <T	
OCT	.200 <T	1.100	
NOV	.100 <T	.200 <T	
DEC	.	IU	
DICHLOROBROMOMETHANE (UG/L)			DET'N LIMIT = 0.05 GUIDELINE = 350 (A1+)
AUG	BDL	IEF	
SEP	BDL	.650	
OCT	BDL	2.250	
NOV	BDL	.250 <T	
DEC	.	IU	
CHLORODIBROMOMETHANE (UG/L)			DET'N LIMIT = 0.10 GUIDELINE = 350 (A1+)
AUG	BDL	IEF	
SEP	BDL	2.700	
OCT	BDL	5.300	
NOV	BDL	.400 <T	
DEC	.	IU	
BROMOFORM (UG/L)			DET'N LIMIT = 0.20 GUIDELINE = 350 (A1+)
AUG	BDL	IEF	
SEP	BDL	6.800	
OCT	BDL	3.200	
NOV	BDL	.400 <T	
DEC	.	IU	
TOTAL TRIHALOMETHANES (UG/L)			DET'N LIMIT = 0.50 GUIDELINE = 350 (A1)
AUG	BDL	IEF	
SEP	BDL	10.250	
OCT	BDL	11.950	
NOV	BDL	1.250 <T	
DEC	.	IU	

TRACE LEVELS OF TOLUENE ARE LABORATORY ARTIFACTS DERIVED FROM THE ANALYTICAL METHODOLOGY.

TRACE LEVELS OF STYRENE ARE CONSIDERED TO BE LABORATORY ARTIFACTS RESULTING FROM THE LABORATORY SHIPPING CONTAINERS.

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A3)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.2	30-500 (A3)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.2	100 (F2)
CHLORIDE	MG/L	0.2	250 (A3)
COLOUR	TCU	0.5	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.0	400 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.1	5.0 (A3)
FLUORIDE	MG/L	0.01	2.4 (A1)
HARDNESS	MG/L	0.5	80-100 (A4)
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.1	30.0 (F2)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
SODIUM	MG/L	0.2	200 (A4)
SULPHATE	MG/L	0.2	500 (A3)
TOTAL NITRATES	MG/L	0.005	10.0 (A1)
TURBIDITY	FTU	0.05	1.0 (A1)
CHLOROAROMATICS			
123 TRICHLOROBENZENE	NG/L	5.0	N/A
1234 TETRACHLOROBENZENE	NG/L	1.0	N/A
1235 TETRACHLOROBENZENE	NG/L	1.0	N/A
124 TRICHLOROBENZENE	NG/L	5.0	10000 (I)
1245-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
135 TRICHLOROBENZENE	NG/L	5.0	N/A
236 TRICHLOROTOLUENE	NG/L	5.0	N/A
245 TRICHLOROTOLUENE	NG/L	5.0	N/A
26A TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
234 TRICHLOROPHENOL	NG/L	100.0	N/A
2345 TETRACHLOROPHENOL	NG/L	20.0	N/A
2356 TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
245 TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
246 TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	50 (A1)
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
PAH			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10.0 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000.0 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALDRIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DES ETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEX)	NG/L	100.0	10000 (A2)
O,P-DDD	NG/L	5.0	10 (I)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	N/A
O,P-DDT	NG/L	5.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PPDDE	NG/L	1.0	30000 (A1)
PPDDT	NG/L	5.0	30000 (A1)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
D-ETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	2 (A4)
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.	100000 (A1)
24-DICHLORORPHENOXYBUTYRIC ACID (24-DB)	NG/L	200.	18000 (B3)
BUTYLATE (SUTAN)	NG/L	2000.	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.	90000 (A1)
CARBOFURAN	NG/L	2000.	90000 (A1)
CHLORPYRIFOS (DURSBAN)	NG/L	20.	N/A
CICP (CHLORPROPHAM)	NG/L	2000.	350000 (G)
DIALLATE	NG/L	2000.	N/A
DIAZINON	NG/L	20.	20000 (A1)
DICAMBA	NG/L	50.	120000 (A1)
DICHLOROVOS	NG/L	20.	N/A
EPTAM	NG/L	2000.	N/A
ETHION	NG/L	20.	35000 (G)
IPC	NG/L	2000.	N/A
MALATHION	NG/L	20.	190000 (A1)
METHYL PARATHION	NG/L	50.	7000 (B3)
METHYLTRITHION	NG/L	20.	N/A
MEVINPHOS	NG/L	20.	N/A
PARATHION	NG/L	20.	50000 (A1)
PHORATE (THIMET)	NG/L	20.	2000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.	140000 (D3)
RELDAN	NG/L	20.	N/A
RONNEL	NG/L	20.	N/A
SILVEX (2,4,5-TP)	NG/L	20.	10000 (A1)
VOLATILES			
1,1 DICHLOROETHANE	UG/L	0.10	N/A
1,1 DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2 DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2 DICHLOROETHANE	UG/L	0.05	5 (A1)

TABLE 6
DRINKING WATER SURVEILLANCE PROGRAM 1990

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
1,2 DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3 DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4 DICHLOROBENZENE	UG/L	0.10	5 (A1)
111, TRICHLOROETHANE	UG/L	0.02	200 (D1)
112 TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1122 TETRACHLOROETHANE	UG/L	0.05	0.17(D4)
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHLYENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	5 (D1)
TRANS 1,2 DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1990, 76 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment (MOE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY
All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS
Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS
Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME
Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION
This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM
Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;

ii/ the water being sampled is not being modified by the sampling system;

iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and

iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake,

discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL
This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

PARAMETER REFERENCE INFORMATION

BENZENE (B2001P) VOLATILES

CLASS: HEALTH METHOD: P0C0D0 UNIT: µg/L

SOURCE	FROM	TO	METHOD	GUIDELINE	UNIT	NOTE
CAL C	85/01			0.700	µg/L	AL
CDWG C	87/01			5.000	µg/L	MAC
EPA C	87/07			5.000	µg/L	MCL
EPAA C	80/11			6.600	µg/L	AMBIENT **
FERC C	84/05			1.000	µg/L	MCL
WHO C	84/01			10.000	µg/L	GV

DESCRIPTION: **NAME:** BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 µg/L

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27). CYCLOHEXATRIENE (41).

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN WITH SMOKING FLAME (30).

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41). THRESHOLD ODOUR: 0.5 - 10 PPM IN WATERTHRESHOLD TASTE: 0.5 mg/L IN WATER (39).
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES, SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM SOILS OR ARE DEGRADED RATHER QUICKLY (80).

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES; COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF

OTHER COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING AGENT; GASOLINE.

TOXICITY: RATING: 4 (VERY TOXIC).
ACUTE: IRRITATING TO MUCOUS MEMBRANES; SYMPTOMS INCLUDE RESTLESSNESS, CONVULSIONS, EXCITEMENT, DEPRESSION; DEATH MAY FOLLOW RESPIRATORY FAILURE.
CHRONIC: MAY CAUSE ANAEMIA AND LEUKAEMIA (45); MUTAGENIC.
MODE OF ACTION: CHROMOABERRATION IN LYMPHOCYTE CULTURES.

CARCINOGENICITY: A KNOWN HUMAN CARCINOGEN.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION, COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION, OXIDATION

ADDITIONAL PROPERTIES:
MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27).
BOILING POINT: 80.1°C (27).
SPECIFIC GRAVITY: 0.8790 AT 20°C (27).
VAPOUR PRESSURE: 100 MM AT 26.1°C (27).
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41).
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39).
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

NOTES: EPA PRIORITY POLLUTANT.

Appendix B

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (**Caution:** HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC),(OWTRI),(OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -when 'special pesticides' are requested three extra bottles must be filled
Cyanide	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (**Caution:** NaOH is corrosive)

Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($K_2Cr_2O_7$) (**Caution:** HNO_3&$K_2Cr_2O_7$ are corrosive)
Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

<u>Steps:</u>

1. Let sampling water tap run for an adequate time to clear the sample line.

2. Record time of day on submission sheet.

3. Record temperature on submission sheet.

4. Fill up all bottles as per instructions.

5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (**Caution:** HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked

Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (**Caution:** HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC) (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top

<u>Steps:</u>

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.